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Old Clocks and Watches and
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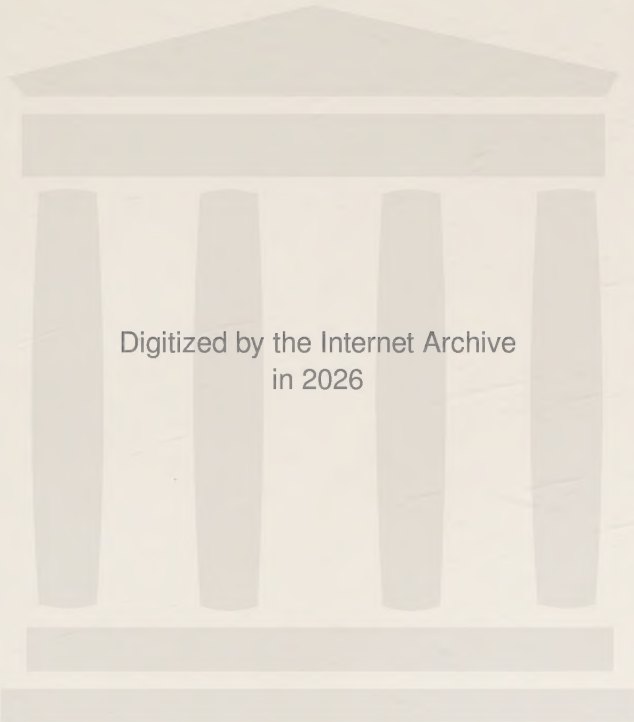
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OLD CLOCKS AND WATCHES
AND THEIR MAKERS

OLD CLOCKS AND WATCHES AND THEIR MAKERS

BEING AN HISTORICAL AND DESCRIPTIVE ACCOUNT OF
THE DIFFERENT STYLES OF CLOCKS AND WATCHES
OF THE PAST, IN ENGLAND AND ABROAD

TO WHICH IS ADDED

A LIST OF EIGHT THOUSAND MAKERS

BY

F. J. BRITTEN

AUTHOR OF

"THE WATCH AND CLOCKMAKERS HANDBOOK, DICTIONARY AND GUIDE,"

"WATCH SPRINGING AND ADJUSTING," ETC.

WITH

FOUR HUNDRED ILLUSTRATIONS, MANY FROM PHOTOGRAPHS

LONDON

B. T. BATSFORD, 94, HIGH HOLBORN

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PREFATORY NOTES.

SINCE the publication of "Former Clock and Watchmakers and their Work" so many suggestions have reached me from lovers of old clocks and watches that I have been induced to recast the volume. Much additional information of a general character has been embodied in the present book, and details relating to modern construction which appeared before are now omitted.

Technical terms are, I am told, particularly exasperating to people unacquainted with horological phrases, and I have therefore avoided them as much as possible. "The Watch and Clockmakers' Handbook, Dictionary and Guide" may be consulted by those especially interested in the mechanism of clocks and watches, and who desire more explicit details than I have given here.

Few places can boast of a finer display of eighteenth-century clocks than Windsor Castle. The principal representative specimens I have been enabled to illustrate and describe by special permission of the Queen.

Additions have been made to the list of old makers and some inaccuracies corrected. Several items of information in connection with this list I have obtained from the magnificent collection of tradesmen's cards owned by the Hon. Gerald Ponsonby, who allowed me free access to this most interesting record. A perusal of the Banks collection of tradesmen's cards at the British Museum has also elicited particulars not to be met with in ordinary channels. Mr. J. E. Hodgkin, F.S.A., furnished me with a list of the clock and watchmakers in his collection, which proves a useful check in several

instances. Mr. C. H. Read, of the British Museum, has given me every possible help in going over the unsurpassed display of time-keepers in his charge, for the purpose of revising the references thereto. A similar favour in respect of the collection at South Kensington Museum has been accorded by Mr. A. B. Skinner.

I have to acknowledge the kindness of many owners of old time-keepers who permitted me to inspect their treasures. In particular I should mention Mr. Albert Schloss, who has choice examples of every period ; he placed the whole of them in my hands for examination, and of these between sixty and seventy have been selected for illustration.

F. J. B.

35, NORTHAMPTON SQUARE, LONDON, E.C.,

April, 1899.

SUMMARY OF INCIDENTS CONNECTED WITH THE DEVELOPMENT OF CLOCKS AND WATCHES.

	YEAR.
The invention of weight clocks attributed to Gerbert (p. 17) about	990
Clock at St. Paul's Cathedral (p. 18) prior to	1298
Hall-marking powers conferred in the Goldsmiths' Company at London (p. 357)	1300
Clock-tower at Westminster (p. 21) about	1300
Clock at Exeter Cathedral (p. 33) prior to	1317
Clock of Lightfoot at Glastonbury (p. 25)	1335
First Strasburg clock (p. 36)	1352
Clock by Henry de Vick (p. 28)	1360
Clock at Dover Castle (p. 33)	1360
Clock at Rouen (p. 24)	1389
Clock at Lübeck (p. 42)	1405
Clock in Piazzì at Venice (p. 55) about	1495
Hele invented the mainspring (p. 56) about	1500
Watches first made (p. 57) about	1500
Stackfreed (p. 66) about	1500
Zech invented the fusee (p. 68) about	1525
Clock by Zech, Society of Antiquaries (p. 69)	1525
Anne Boleyn's clock (p. 46)	1532
Turret clock at Hampton Court Palace (p. 49)	1540
Paris clockmakers incorporated by statute (p. 49)	1544
Cruciform watches (p. 102) from about	1555
Skull Watches (p. 93) from about	1560
Octagonal watches from about	1565
Floral watches (p. 106) from	1570
Clock by Bartholomew Newsam in the British Museum (p. 152)	1580
Watchmaking in Switzerland said to have been introduced by Charles Cusin ..	1587
Clock by Isaac Habrecht at British Museum (p. 51)	1589
Glasses for table clocks first used about	1598
Clock at Lyons Cathedral (p. 52)	1598
Small oval or Nuremberg egg watches (p. 113)	1580-1640
English lantern chamber clocks first manufactured (p. 299) about	1600
Queen Elizabeth's watches (p. 90)	1571-1603
Watch-glasses introduced about	1610
Watches first worn in the pocket (p. 116) about	1625
Watchmakers' Company incorporated (p. 163)	1631
Introduction of the pendulum (p. 339) about	1641
Loose outer cases for watches introduced (p. 126) about	1645
Balance spring invented by Hooke (pp. 199, 344) about	1658
Enamel decoration was occasionally employed on early watches, but cases adorned with enamel painting, executed by Toutin and other French artists of his school, became the fashion about	1660

	YEAR.
The Virgule, a primitive form of duplex escapement, said to have been invented by Hautefeuille about	1660
— Pendulum first applied to domestic clocks (p. 300)	1661
Fusee chain to supersede catgut invented by Gruet	1664
Watches with minute-hands (p. 141) about	1665
Huygens' pendulum clock with cycloidal cheeks (p. 201) about	1670
Watch cocks formed with the table of circular outline to protect the balance about	1670
— Anchor escapement invented by Hooke (p. 201) about	1670
St. Dunstan's clock (p. 206)	1671
Rack striking work invented by Barlow (p. 172)... ..	1675
Repoussé chasing applied to watch cases about	1675
Tulip pillars in watch movements	1676-1700
Plain enamelled dials for watches about	1680
Watches with balance arranged to appear as a pendulum about	1680
Enamelled plaques over watch bridges from about	1680
— Long pendulum clocks (p. 339) about	1680
First keyless watch (p. 351) about	1680
Revocation of the Edict of Nantes, by which many French horologists were driven to England	1685
Repeating watches patented by Quare (p. 190)	1687
Equation clocks introduced (p. 253) about	1690
Dead-beat escapement for watches invented by Tompion (p. 177)	1694
Cylinder escapement patented (p. 172)	1695
Watch jewellery invented (p. 351)	1704
Caps applied to watch movements about	1710
Rack-work for winding repeating watches invented by Stogden about	1710
One-year clocks (pp. 190, 320) from	1690-1710
— Dead-beat escapement for clocks invented by Graham (p. 186, about... ..	1715
Mercurial pendulum invented by Graham (p. 186) about	1723
Pinchbeck alloy invented (p. 223) about	1725
Bells for repeating watches were used in England as late as 1800 ; wire gongs, at first more popular in France than England, are said to have been applied to repeaters by Julien Le Roy about	1750
Watch cases decorated by gold of various colours soldered on and chased (p. 491) about	1760
Harrison's chronometer taken on a voyage to Jamaica (p. 217)	1761
The marine chronometer or timekeeper for ascertaining the longitude (p. 235).	1761
Seconds hands became popular after the successful trial of Harrison's watch in	1761
Lever escapement invented by Mudge (p. 226) about	1765
Watch movement remodelled with a view to reduce its thickness, by Lepine, about	1770
Helical spring patented by Arnold (p. 230)	1775
Spring detent escapement by Earnshaw and Arnold (pp. 231, 233) about	1780
Duplex escapement patented by Tyrer	1782
Compensation balance by Earnshaw (p. 231) about	1782
Rack lever escapement said to have been invented by Hautefeuille about 1722, but patented and introduced by Litherland in	1791
Duties imposed on owners of watches and clocks in	1797

OLD CLOCKS AND WATCHES AND THEIR MAKERS.

AS defined by the title, our subject may be said to begin with the introduction of clocks; and, although primitive methods of timekeeping should not, perhaps, be passed over without notice, it will be unnecessary to make more than a brief reference to them. It may be convenient and useful to begin with some explanation of the various time standards.

STANDARDS OF TIME.

Solar time is marked by the diurnal revolution of the earth with regard to the sun, so that the instant the sun is seen at its greatest height above the horizon it is true midday, which sometimes takes place 16 min. 18 sec. sooner, and at others 14 min. 28 sec. later, than twelve o'clock mean time. The diurnal rotation of the earth on its axis might naturally be supposed to bring each place to the meridian at regular intervals; this would be nearly the case if the earth had no other movement; but it advances at the same time in its orbit, and as the meridians are not perpendicular to the ecliptic, the days are not of equal duration. This may be easily perceived by placing a mark at every 15° of the equator and ecliptic on a terrestrial globe, as, by turning it to the westward, the marks on the ecliptic, from Aries to Cancer, will come to the brazen meridian sooner than the corresponding ones on the equator, those from Cancer to Libra later, from Libra to Capricorn sooner, and from Capricorn to Aries later; the

marks on the ecliptic and equator only coming to the meridian together at Aries, Cancer, Libra, and Capricorn ; thus true and mean time would agree on the days in which the sun enters these signs, which is on the 20th March, 21st June, 23rd September, and 21st December, were it not that the earth moves with greater rapidity in December, when it is nearest the sun, than it does in July, when it is at its greatest distance from it. The regularity of the earth's motion is also further disturbed by the attraction of the moon, Venus, and Jupiter. True and mean agree about the 25th December, 15th April, 14th June, and 31st August ; these coincidences vary slightly in different years, because the earth takes about a quarter of a day more than a year to complete a revolution in its orbit, and this error accumulates from leap year till the fourth year after, when the extra day is taken in.

• Sun-dials mark apparent time, while clocks measure equal or mean time; if, therefore, a timekeeper, perfectly regular in its motion, were set to apparent solar time, it would be found to agree with it only on four days in the year.

Cycle of the Sun.

A cycle of the sun is a period of 28 years, after which the days of the week again fall on the same days of the month as during the first year of the former cycle. The cycle of the sun has no relation to the sun's course, but was invented for the purpose of finding the Dominical Letter which points out the days of the month on which the Sundays fall during each year of the cycle. Cycles of the sun date nine years before the Christian era. If it be required to know the year of the cycle in 1892, nine added will make 1901, which, divided by 28, gives the quotient 67, the number of cycles that have passed, and the remainder 25 will be the year of the cycle answering to 1892.

Sidereal Time.

Sidereal time, the standard used by astronomers, is measured by the diurnal rotation of the earth, which turns on its axis in 23 hours 56 min. 4·1 sec. The sidereal day is therefore 3 min. 56 sec. less than the mean solar day, and a clock to show sidereal time must have its pendulum a trifle shorter than a mean-time clock with the same train. About the 15th of April the sidereal clock and the mean-time clock would agree, but from that time the divergence between the two would be increased each day by 3 min. 56 sec.

Mean-time clocks, though, can be regulated by the stars with greater facility than by the sun, for the motion of the earth with

regard to the fixed stars is uniform, and a star will always appear at the meridian 3 min. 56 sec. sooner than it did on the preceding day. In the absence of a transit instrument and a table giving the right ascension of particular stars, choose a window having a southern aspect, from which the steeple of a church, a chimney, or any other fixed point may be seen. To the side of the window attach a thin plate of brass having a small hole in it, in such a manner that by looking through the hole towards the edge of the elevated object, some of the fixed stars may be seen; the progress of one of these being watched, the instant it vanishes behind the fixed point a signal is made to a person observing the clock, who then notes the exact time at which the star disappeared, and on the following night the same star will vanish behind the same object 3 min. 56 sec. sooner. If a clock mark 10 hours when the observation is made, when the star vanishes the following night it should indicate 3 min. 56 sec. less than 10 hours. If several cloudy nights have rendered it impossible to compare the clock with the star, it will then be necessary to multiply 3 min. 56 sec. by the number of days that have elapsed since the observation, and the product deducted from the hour the clock then indicates gives the time the clock ought to show. The same star can only be observed during a few weeks, for as it gains nearly one hour in a fortnight, it will, in a short time, come to the meridian in broad daylight and become invisible; to continue the observation, another star must be selected. In making the observation, care must be taken that a planet is not observed instead of a star; Mars, Jupiter, and Saturn are those most likely to occasion this error, more especially Saturn, which, from being the most distant of the three, resembles a star of the first magnitude. The planets may, however, be easily distinguished, for being comparatively near the earth, they appear larger than the stars; their light also is steady because reflected, while the fixed stars scintillate and have a twinkling light. A sure means of distinguishing between them is to watch a star attentively for a few nights; if it change its place with regard to the other stars it is a planet.

Duration of a Year. The earth performs its revolution round the sun in 365 days 5 hours 48 min. 49·7 sec. No account was taken of the odd hours till the year B.C. 45, when the error in the computation of the year had become very considerable. The surplus, 5 hours 48 min. 49·7 sec., was then taken as six hours, making one day in four years; this day was therefore

added to every fourth year. There still remained the apparently trifling difference of 11 min. 11 sec. between the computed and the real year ; this, however, produced an error of about seven days in 900 years. In 1582, Pope Gregory XII. struck out ten days, which represented the accumulated error, from the calendar, and it was decided that three leap years should be omitted every 400 years ; thus, as 1600 was leap year, the years 1700, 1800, and 1900 are not, but 2000 will be leap year. This rectification was not adopted in England till 1752, when eleven days were omitted from the calendar. As our year still exceeds the true year, although by an extremely small fraction, another leap year in addition to those should be omitted once in 4000 years.

**The Golden
Number.**

Meton, an Athenian astronomer, B.C. 432, discovered that after a period of nineteen years the new and full moons returned on the same days of the month as they had done before ; this period is called the cycle of the moon. The Greeks thought so highly of this calculation, that they had it written in letters of gold, hence the name Golden Number ; and at the Council of Nice, A.D. 325, it was determined that Meton's cycle should be used to regulate the movable feasts of the Church. Our Saviour was born in the second year of the lunar cycle. Therefore, if we add one to the present year, and divide the sum by 19, the remainder will give the year of Meton's cycle. $1892 + 1$ divided by 19 leaves a remainder of 12, which is, therefore, the Golden Number for 1892.

The Epact.

The Epact serves to find the moon's age by showing the number of days which must be added to each lunar year, in order to complete a solar year. A lunar month is composed of 29 days 12 hours 44 min. 3 sec., or rather more than 29½ days ; 12 lunar months are, therefore, nearly 11 days short of the solar year—thus, the new moons in one year will fall 11 days earlier than they did in the preceding year, so that were it new moon on January 1st, it would be nearly 11 days old on the 1st of January of the ensuing year, and 22 days on the third year ; on the fourth year it would be 33 ; but 30 days are taken off as an intercalary month (the moon having made a revolution in that time), and the three remaining would be the Epact ; the Epact thus continues to vary, until, at the expiration of 19 years, the new moons again return in the same order as before. If the solar year were exactly 11 days longer than 12 lunar months, it would only be necessary to multiply the Golden Number by 11, divide the product by 20, and

the remainder would be the Epact ; but, as the difference is not quite 11 days, one must be taken from the Golden Number, and the remainder multiplied by 11, and the product, if less than 30, shows the Epact ; but if more it must be divided by 30, and the remainder is the Epact for that year.

The Number of Direction. The Council of Nice decided, A.D. 325, that Easter Day is always the first Sunday after the full moon which happens upon or next after the 21st of March.

Easter Day, therefore, cannot take place earlier than the 22nd of March or later than the 25th of April. The Number of Direction is that day of the thirty-five on which Easter Sunday falls.

The Roman Indiction. The Roman Indiction was a period of fifteen years, appointed A.D. 312 by the Emperor Constantine for the payment of certain taxes.

The Julian Period. The Julian Period of 7980 years is the product obtained by multiplying together 28, 19 and 15, which numbers represent the cycles of the sun, the moon, and the Roman Indiction. The beginning of the Julian Period is reckoned from 709 before the creation of the world, so that its completion will occur A.D. 3267, until which time there cannot be two years having the same numbers for three cycles.

Timekeepers are more immediately concerned with the subdivisions of a day. The Persians divided the day into 24 hours, starting from sunrise ; the Athenians began the day at sunset ; the present civil day begins at midnight, and is divided into two equal periods of 12 hours each, but astronomers reckon from noon and count the hours continuously from 1 to 24.

Wick Timekeepers. Among the primitive timekeepers adopted by Chinese and Japanese was a kind of wick about two feet in length, made of material resembling flax or hemp, which underwent some process, so that when ignited it would smoulder without breaking into a flame. Knots were tied at particular distances, and the effluxion of time estimated as the sections between the knots smouldered away. Mons. Planchon, of Paris, has one of these curiosities, which I am assured is a genuine relic.

SUN-DIALS.**Meridian
Dials.**

The simplest form of sun-dial, and a useful one for setting a timekeeper when no standard is available for comparison, is one for showing when the sun is on the meridian. With a timekeeper showing mean time and an equation table, a meridian line may, of course, be at once traced for future reference. In the absence of these, the following, which are practically Ferguson's instructions, may be followed: "Make four or five concentric circles, a quarter of an inch from one another, on a flat stone, and let the outmost circle be but little less than the stone will contain. Fix a pin perpendicularly in the centre, and of such a length that its whole shadow may fall within the innermost circle for at least four hours in the

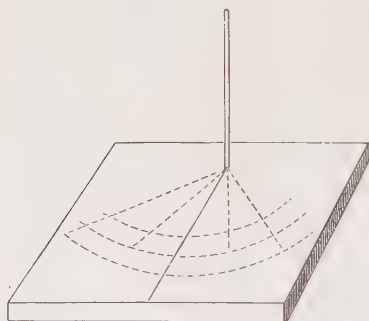


FIG. 1.

middle of the day. The pin ought to be about an eighth of an inch thick, with a round blunt point. The stone being set exactly level, in a place where the sun shines, suppose from eight in the morning till four in the afternoon, about which hours the end of the shadow should fall without all the circles; watch the times in the forenoon when the extremity of the shortening shadow just touches the several circles, and there make marks. Then, in the afternoon of the same day, watch the lengthening shadow, and where its end touches the several circles, in going over them, make marks also. With a pair of compasses, find exactly the middle points between the two marks on any circle, and draw a straight line from the centre to that point, which line will be covered at noon by the shadow of a small upright wire, which should be put in place of the pin. The reason for drawing several circles is, that in case one part of the day should prove clear, and the other part somewhat cloudy, if you miss the time when the point of the shadow should touch one circle, you may perhaps catch it in touching another."

By observation the hours of the morning and afternoon may also be marked on the meridian dial, and it will be noticed that, although

the position of the hour immediately preceding corresponds with the one immediately after noon, these divisions will not answer for any of the remaining hours.

Curious Meridian Dial. The very ingeniously contrived meridian dial shown below and reproduced from *L'Horlogerie* by Joseph Rambal, formed part of St. Peter's Cathedral, Geneva, from 1760 till the renovation of the building in 1894, and has since been restored on the initiative of the

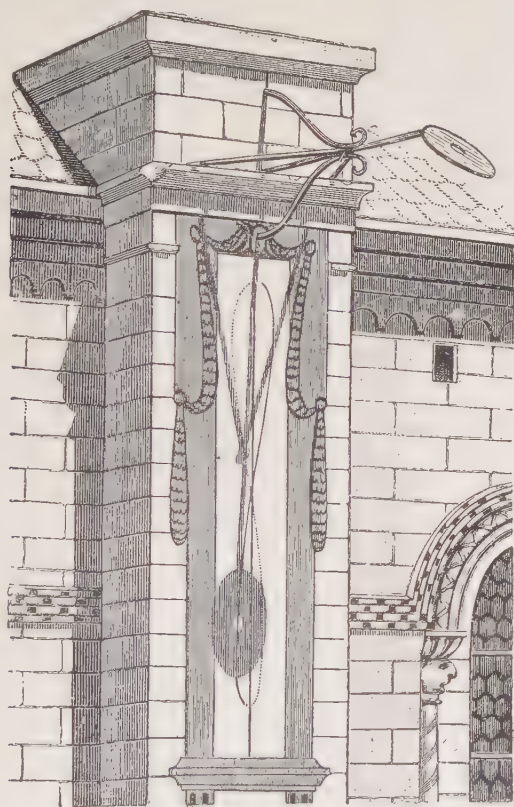


FIG. 2.—Curious Meridian Dial.

Society of Arts. The white spot in the centre of the disc's shadow not only indicates accurately solar noon when it is bisected by the central vertical line, but also approximately mean solar noon when it is centrally over a line of the figure-of-8 loop which allows for the equation of time on each particular day. The full line of the loop

serves from June to December, and the dotted line during the complement of the year. As the year is not made up of a complete number of days, and a day is interpolated every fourth year, the exact equation in each year of the four is different; still the approximate equation would be practically sufficient for all but scientific purposes.

The art of dialling is somewhat complex. A glance at the figure below will show why, except for places on the equator, the hour spaces are not all equal. A sun-dial may be regarded as a circle round the earth, or as the edge of a disc which passes through the centre of the earth from the spot where the dial is fixed. *a, b, c, d, e, f, g, etc.*, are longitudinal circles, representing the hours, B the

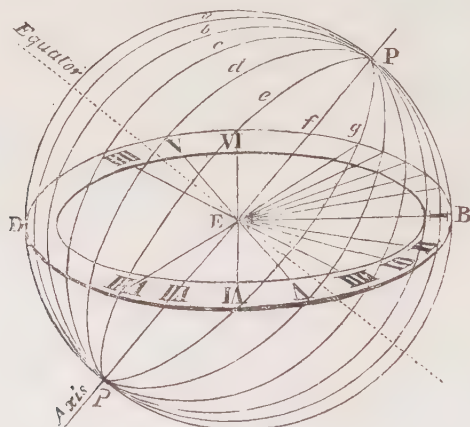


FIG. 3.

spot where the dial is situated, D the corresponding latitude, P P the poles, and E the centre of the earth.

A dial prepared for any particular place is useless for another place in a different latitude, with the exception that a *horizontal* dial for a certain latitude will be a vertical dial for a latitude which is the complement of the first, or what it wants of 90° . That is, a horizontal dial for our latitude of $51\frac{1}{2}^\circ$, would have to be placed in a vertical position facing the south in latitude $38\frac{1}{2}^\circ$.

Horizontal Sun-dial.

To set out a horizontal dial, first draw two lines parallel to each other, at a distance equal to the thickness of the gnomon which is to cast the shadow.

Next, draw a line at right angles to these, the extremities of which will indicate respectively the hours of six in the

morning and six in the evening. Then, with A and B as centres (see Fig. 4), draw quadrants of circles, and divide each into 90° . Now, assuming the dial to be for the latitude of London, lay a rule over B, and draw the first line through $11\frac{2}{3}^\circ$, and second through $24\frac{1}{4}^\circ$, third $38\frac{1}{2}^\circ$, fourth $53\frac{1}{2}^\circ$, and fifth $71\frac{1}{5}^\circ$. Proceed the same with the other side. Extend the afternoon hour lines of four and five across the dial, and these will form the morning hours, while eight and seven of the morning hours prolonged will give the same evening hours. To form the style or gnomon, draw a radial line through that degree of the quadrant which corresponds to the latitude $= 51\frac{1}{2}^\circ$. This will show the elevation of the style, which

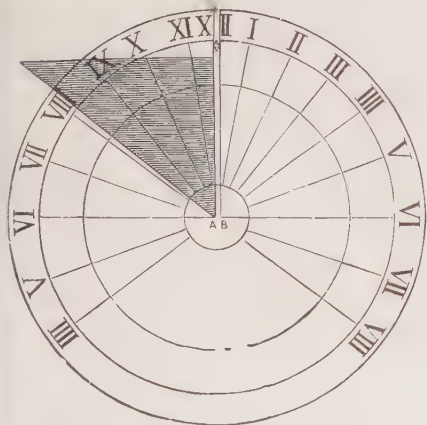


FIG. 4.—Horizontal Sun-dial.

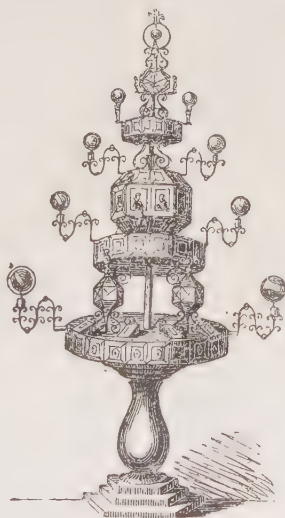


FIG. 5.—Dials at Whitehall, 1669.

is here represented as if lying on the surface of the dial. The thickness of the style must be equal to the distance between A and B. Place the style truly upright on the dial, and it is finished.

A dial, or rather a series of dials of every conceivable description, forming a structure, as shown in Fig. 5, was erected in Whitehall in 1669, by order of Charles II. It was the invention of Francis Hall, *alias* Line, a Jesuit and professor of mathematics at Liege. Vertical dials, inclining dials, and dials for showing time as computed by various nations at different periods were all included.

Of these, the bowls or brackets appear to be the most attractive. One, on the first platform, to show the hour by fire, consisted of a

little glass bowl filled with clear water. This bowl was about three inches diameter, placed in the middle of another sphere, about six inches diameter, consisting of several iron rings or circles, representing the hour circles in the heavens. The hour was known by applying the hand to these circles when the sun shone, and that circle where you felt the hand burnt by the sunbeams passing through the bowl filled with water showed the true hour.

This curious erection had no covering ; exposure to the elements and other destroying influences led to its speedy decay and subsequent demolition. The engraving is taken from the *Mirror*, vol. xiv.

The commonest form of portable dial is shown in Fig. 6. When held to the sun, by means of the small ring at top, a ray of light passed through a tiny hole and impinged on the inner surface of the opposite side of the rim, which was engraved with numerals corresponding to the hours of daylight. The hole was formed in a slide which covered a slit in the rim. The slide could be moved higher or lower, and signs of the zodiac were engraved on the rim as a guide to its position in different months of the year. Dials of this sort were in general use during the sixteenth and seventeenth centuries. A small horizontal dial like Fig. 4, but with a hinged style and a compass attached, formed a more costly pocket "horologium."



FIG. 6.

horizontal dial like Fig. 4, but with a hinged style and a compass attached, formed a more costly pocket "horologium."

CLEPSYDRÆ, OR WATER CLOCKS.

These indicate intervals of time by the passage of water, and may be divided into two classes: the ancient recorders for hours of varying length, and the more simple instruments used during and after the seventeenth century, when equal hours were measured.

Clepsydræ are of remote antiquity. They were known by the Egyptians, in Judea, Babylon, Chaldea, and Phœnicia, but these contrivances for measuring time were of the simplest description.

They consisted, to quote from Athenée, of a basin filled with water and exposed in some niche or corner of a public place. At the extreme end of the vessel was a spout or tap, from which trickled the liquid, drop by drop, into a receiver having on its inside marks for indicating the hours of the day and night.

In parts of Southern India was used a thin copper bowl about five inches in diameter and rather deeper than half a sphere, having a very small hole in the bottom. The bowl, placed in a vessel containing water and floating thereon, gradually filled. At the expiration of an arranged interval it sank, and a boy or other watcher then struck a gong, and thus announced the time. One of these bowls is among the collection of the Horological Institute.

It sinks after the lapse of forty-five minutes with tolerable accuracy, but the time is varied somewhat with the temperature of the water. A form of clepsydra, said to have been in use in Egypt about 300 B.C., is shown in Fig. 7, for which I am indebted to Dr. Pearson's article in Rees' Cyclopædia. A supply of water ran through the pipe H into the cone A, and from there dropped into the cylinder E. A conical stopper B regulated the flow, and the superfluous water escaped by the waste pipe I. The Egyptians divided the period between sunrise and sunset into twelve equal hours, so that the conical stopper had to be adjusted each day, and marks for every day in the year, and for the particular latitude of the place, were cut on the stalk D as a guide to the position of the stopper. A floating piston terminating in a rack served to actuate a pinion, to the arbor of which an hour hand was fixed.

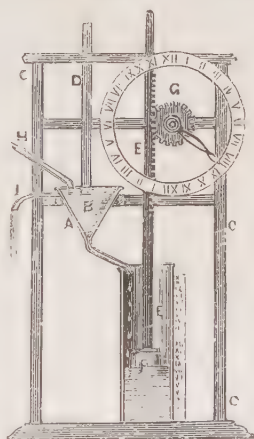


FIG. 7.

In Fig. 8 is shown an improved clepsydra, constructed so that its aperture is adjusted as the year advances by the putting of an index to the sun's place in an ecliptic circle.

It consists, first, of a reservoir A, to the top of which is attached a waste pipe to carry off the superfluous water, and thus keep it at the same level. A pipe B projects from this vessel into the rim of a drum M N, on the front of which is a circle with the signs of the ecliptic engraved thereon. A smaller drum O F L passes within the large one, having attached to it an index. This drum has a

groove or slot *a b* cut through it, tapering in breadth both ways to a point. When in its place, this tapering groove comes just under the orifice of the pipe leading from the reservoir. This inner drum turns on a pipe or tube *F*, which is continued within and has a funnel at the end (not seen) for receiving the water as it drops through the groove in the drum. The index is double, *L* for day and *O* for night, and it will be evident that, as it is turned, the capacity of the orifice is altered, and the water passes more or less rapidly through the pipe.

The ecliptic being properly divided, the hand was set to the proper sign in which the sun then was, and was altered as he shifted

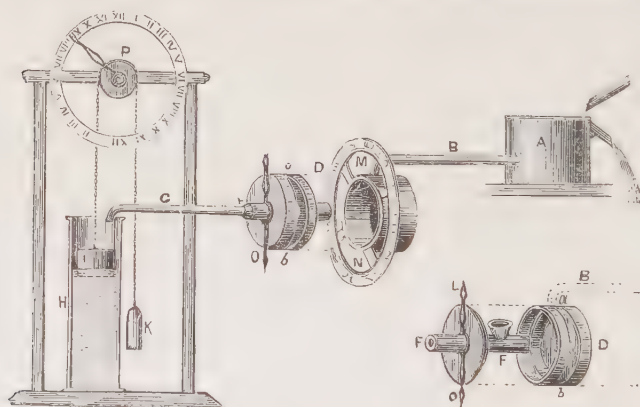


FIG. 8.

round the ecliptic. The water thus regulated, dropped into a cylindrical vessel *H*, within which was a float *I*, connected by a chain passing over a pulley on an arbor *P*, and having a counterpoise *K* at its other end. This pulley carried an index which pointed out the hours on a circle.

The next is ascribed to Ctesibius, the son of a barber, about 200 B.C. It was a self-adjusting machine, and is shown in Fig. 9, taken from the *Horological Journal*. The water dropped into a funnel *A*, from the eyes of a figure placed over it, and connected with a full reservoir, thus ensuring a constant pressure. The tube conveyed the water into an open cylinder with a float and a light pillar *C* attached. On the top of this pillar a human figure is placed, which points to the divisions on a large column. As the water rises in the cylinder, it also rises in the small tube or short leg

of a syphon F B E, till it reaches the top, when it flows over the bent part, and quickly empties the cylinder, bringing down the float, and with it the index to the starting-point. So far it would have measured hours of equal length; but the Egyptian method required some further contrivance to accommodate it to hours of varying length. This was done by drawing the divisions around the large column out of a horizontal line, so as to vary in their distance on different sides. The water as it came from the syphon fell into a chambered drum K, which turned with the weight as each compartment became filled. On the axis of this drum was placed a pinion gearing with a contrate wheel I, which, by another pinion H, turned a wheel G, to the axis L of which the column was fixed. The lines were drawn slanting round the column to suit the hours of varying length throughout the year. The clepsydra was introduced into Greece by Plato. The introduction of the clepsydra into Rome took place about 157 B.C., by Scipio Nasica. Pliny tells us that Pompey brought a valuable one among the spoils from the eastern nations, which he made use of for limiting the speeches of the Roman orators. Julius Cæsar is said to have met with an instrument of the kind in England, by the help of which he observed that the summer nights of this country are shorter than they are in Italy.

With the decadence of Rome, when orators had certain periods of time allotted to them in the law courts for accusation or defence, the clepsydra was often, it is said, tampered with in the interest of particular suitors by adding to or subtracting from the wax used in the lawful regulation of the flow of water, or by using the fluid in an impure condition.

In 807 a water clock of bronze inlaid with gold was presented by the King of Persia to Charlemagne.

Gifford in his history of France says: "The dial was composed of twelve small doors, which represented the hours; each door opened at the hour it was intended to represent, and out of it came the same number of little balls, which fell one by one, at equal intervals of time, on a brass drum. It might be told by the eye what hour it was by the number of doors that were open, and by the ear by the number of balls that fell. When it was twelve o'clock twelve horsemen in miniature issued forth at the same time and shut all the doors."

Hamburger, in Beckmann's "History of Inventions," dates the revival of clepsydræ to some time between 1643 and 1646; and

Dr. Hutton asserts that in 1693 the first water clock was brought to Paris from Burgundy.

Fig. 10 represents a clepsydra of the seventeenth century, consisting of an oblong frame of wood, A B C D, to the upper part of which two cords are fixed, their lower ends being wound round the axis of the drum E. The drum is shown in section at Fig. 10A. It has seven water-tight metallic partitions, F f, G g, H h, I i, K k, L l, and M m. If, now, the cord be wound around the axis until the drum

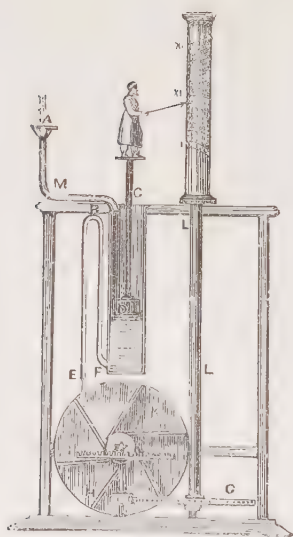


FIG. 9.

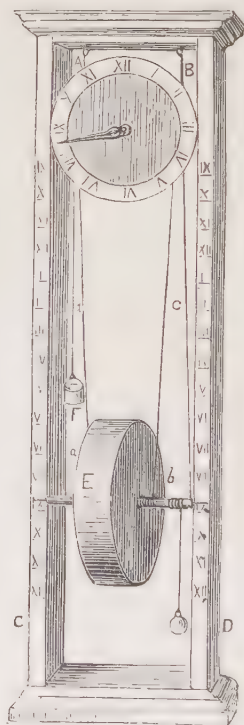


FIG. 10.

risks to the top of the frame, and the drum be left to obey the force of gravity, it will of course tend to fall, and the cord resisting this tendency will cause it to revolve rapidly as it descends. But if we introduce water into the vessel, it will be retained in certain parts of the circumference by these partitions, and, one side being thus heavier than the other, the tendency to revolve will be counteracted, and the drum will remain stationary. If now we pierce a small hole near the bottom of each cell, the water will slowly ooze

from it into another, thus reducing the opposing weight of water, and causing the drum slowly to revolve. The rate of motion being properly regulated by altering the size of the apertures, the axis will point out the hours on the side of the frame ; or a cord $c d$, with a weight F , may be made to pass over a pulley attached to an arbor bearing an index or hand to point out the hours on a circle properly engraved or painted.

The sealed water drum with partitions was utilized in another way which was described in *Engineering* some years ago, and will be understood on reference to the front and side views (Figs. 11 and 12). The drum A is suspended from two cords $e e$. An index placed loosely on the end of the arbor a is weighted at

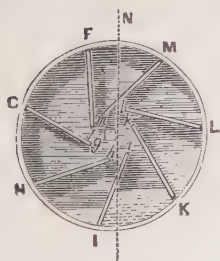


FIG. 10A. —Section of Drum.

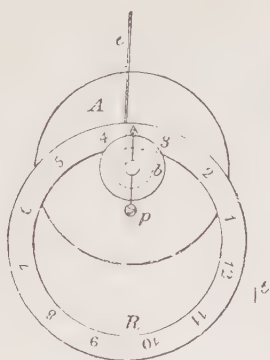


FIG. 11.

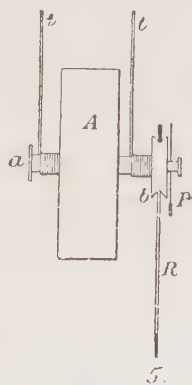


FIG. 12.

its lower end p . A grooved pulley b is fixed to the arbor and on it hangs the hour ring R which is carried round by its adhesion to the pulley b .

A very simple form of clepsydra is shown in Fig. 13. It is merely a glass vessel which has an orifice at the bottom, and is filled with as much water as will flow out in exactly twelve hours, figures being placed at the proper distances to denote the successive hours. Fig. 14 shows an open vessel with a syphon attached to a float. The syphon will empty the vessel of the whole of the contained fluid, and the pressure exerted, being equal to the difference in length between the shorter and longer leg, remains always the same in consequence of the float falling as the water falls. Other clocks were also made, in which the weight of the water was made to keep a pendulum in motion.

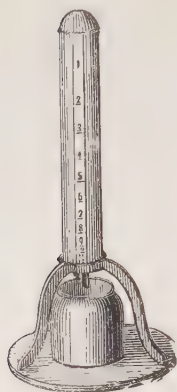


FIG. 13.

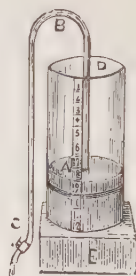


FIG. 14.

The construction of clepsydræ and of weight clocks went on contemporaneously for a long period. A water clock was among the contrivances of the boyhood of Sir Isaac Newton.

WEIGHT CLOCKS.

So many vague and contradictory records exist as to the invention of clocks composed of an assemblage of wheels actuated by a weight, that any attempt to fix the exact date of their introduction would be mere guesswork.

It is claimed that Pacificus, Archdeacon of Verona, who died in the middle of the ninth century, devised a clock which Bailly, in his "History of Modern Astronomy," considers was furnished with an escapement; but this is not substantiated, and other authorities decide that it was a water clock. Charlemagne's Clepsydra which sounded the hours is also sometimes erroneously referred to as a weight clock.

In Stow's Chronicles, under date 606, it is stated: "This year dyed St. Gregory; he commanded clocks and dials to be set up in churches to distinguish the houres of the day." These were probably sun-dials, and Stow's introduction of the word clocks is therefore unwarranted.

The Latin "horologium" or the Italian "orologio" was used indiscriminately for sun-dials, clepsydræ and other timekeepers. Clocks other than sun-dials were also designated nocturnal dials to

distinguish them from those which showed the hour by the solar shadow only.

Gerbert, a monk, afterwards Pope Sylvester II., placed a clock in Magdeburg Cathedral at the end of the tenth century ; but Dithmar declares it was only a kind of sun-dial ; other writers consider Gerbert to be the originator of the escapement. Whatever may be inferred, there is no absolute proof that an escapement was constructed for more than two centuries after Gerbert's time, though it is pretty certain that clocks of some sort existed in cathedrals and monasteries during the twelfth and thirteenth centuries.

The word "clock," whether derived from the Saxon *clugga*, the Teutonic *glocke*, the Latin *glocio*, or the French *cloche*, signified "a bell," and there is reason to suppose that many of the early efforts consisted merely of a bell sounded at regular intervals by hand, the instant of ringing being determined by a sun-dial or sand-glass.

In monasteries prayers were recited at certain fixed hours of the night as well as of the day, and as the monks were not always unfettered by sleep at the needful moment, this horologe or alarum was probably invented to rouse the drowsy *religieux* to a due sense of his duties. In the "rule" of the monks of Citeaux, drawn up about 1120, and quoted by Calmet, the duty is prescribed to the prior of so adjusting the abbey clock that it may strike and wake the monks for matins. Durandus, in the thirteenth century, alludes to the clock as one of the essential features of a church. Dante, who was born in 1265 and died in 1321, mentions an "horologia" which struck the hours ; and Chaucer, who was born in 1328 and died in 1400, speaks of the cock crowing as regularly as clock or abbey horologe.

Berthoud considered it likely that a revolving fly was used as a controller prior to the invention of an escapement.

Captain Smyth, R.N. (*Archæologia*, vol. xxiii.), suggests that John Regestein of Cologne, who is spoken of as having improved clocks in the fourteenth century, was possibly the inventor of the escapement. Still it is only surmise.

An early clock often referred to is the one which was presented by Aladdin of Egypt to the Emperor Frederick II. of Germany, in the year 1232. It is described as resembling internally a celestial globe, in which figures of the sun, moon, and other planets, formed with the greatest skill, moved, being impelled by weights and wheels. There were also the twelve signs of the Zodiac, with appropriate characters, which moved with the firmament.

There was, prior to 1298, a clock at St. Paul's Cathedral which struck the hours on a bell by means of mechanical figures; and Decker, in his "Gull's Hornbook," calls them "Paul's Jacks." In the accounts of the cathedral for the year 1286 the allowances to Bartholomo Orologiario the clock-keeper are entered, namely, of bread at the rate of a loaf daily. In 1344 the dean and chapter entered into a contract with Walter the Orgoner of Southwark to supply and fix a dial. It is suggested that the clock previously struck the hours, but had no dial. In Dugdale's history of the old cathedral the dial is referred to as follows: "Somewhat above the stonework of the steeple was a fine dial, for which there was order taken in the 18th of Edward III., that it should be made with all splendour imaginable, which was accordingly done; having the image of an angel pointing to the hours both of the day and night."

The dial was placed below the "Jacks," who were not ousted from office, but continued to strike the hour with their accustomed regularity. Decker says "the time of St. Paul's goes truer by five notes than St. Sepulchre's chimes." There appears but little doubt that dials were absent from most of the early clocks. M. Viollet le Duc ("*Dictionnaire Raisonné de l'Architecture Française*") observes that from the twelfth to the fourteenth centuries no space was arranged in the towers of churches for dials which could be seen at a distance. The earliest dials, he says, were covered by small projecting roofs and made either of wood or lead and decorated in colours. Mechanical figures similar to the St. Paul's "Jacks" seem to have been in use before the introduction of dials, and proved to be a lasting attraction.

Froissart, who had an affection for clocks, speaks of one which existed at Courtray prior to 1370 as the largest which had then been made. It was brought from thence with other spoils of war in 1382, by Philip, Duke of Burgundy, who presented it to the people of Dijon. The clock was surmounted with his crest, and set up at Dijon in a tower of the Church of Notre Dame. In a turret over it were a bell and the figures of a man and woman, one on each side, which struck the hours. To the present day these automata are locally called *Jacquemarts*, and G. Peignot, author of a dissertation on them, contended that they received their name from Jacquemart, a clock and lock maker of Lille, who was employed by the Duke of Burgundy in the year 1442. The appellation, however, seems to be merely a corruption of *Jacomarchiadus*, i.e. a man in a suit of armour. During the middle ages it was the custom to place as

entries on the belfries on tops of towers mailed men to watch over the safety of castles and towers, and their office was to give alarm at the approach of an enemy, a fire or other disturbing event.

In Fig 15 is shown a " Jack " which, though not on active service, is still in Southwold Church. It is an oak figure, three feet six inches high, of a man clad in armour, and is said to date from early in the fifteenth century. Locally it is known as " Jack the Smiter."

The engraving is from a photograph by Mr. J. Martyn, Southwold. An excellent representation of striking clocks exists at the Church of St. Mary Steps, Exeter; in the tower of Holy Trinity Church, Bristol, which was demolished in 1787, was a pair; and in a recess of the south aisle of Norwich Cathedral were two small Jacks which, actuated by wires from the clock, struck the quarters on adjacent bells. Of the Peter Jacks, and two at the Church of St. Dunstan's, Fleet Street, which are dear to Londoners of the last century, I shall be able to give engravings.

In the early part of the fourteenth century, a large stone tower was built in Palace Yard, opposite Westminster Hall, and a clock placed therein which struck every hour upon a great bell. There is tradition that in the sixteenth year of the reign of Edward I. (1298) the Lord Chief Justice Randulphus Hengham, having made an

error in a record, was fined 800 marks by the king's order, and the money was applied to defray the cost of erecting a public clock beside the entrance to Westminster Hall. The first official mention of Hengham's punishment extant appears to be in a Year Book of the time of Richard III., where it is stated that on an occasion when the king closeted the judges in the Inner Star Chamber to consider various points submitted to them, one of the



FIG. 15.—" Jack the Smiter,"
Southwold Church.

judges cited the case of Hengham, and said the offence consisted of altering a record so that a poor defendant might have to pay but 6s. 8d. instead of 13s. 4d., but nothing is said respecting the building of a clock. Stow, who was born in 1525 and died in 1605, in his *Account of Westminster* (vol. ii. p. 55) states that the clock was provided from Hengham's fine; and the Hon Daines Barrington, in an interesting letter to Mr. Justice Blackstone in 1778 (*Archæologia*, vol. v.) accepts the tradition, which is very possibly well founded, although it must be confessed that the evidence on the point is not conclusive. In an Issue Roll of the forty-fourth year of the reign of Edward III. is recorded the payment of two pounds to John Nicole, keeper of the great clock of the king within the Palace of Westminster, being his wages for eighty days at the rate of sixpence a day. In subsequent reigns further references are made to the keeper of this clock. In the first year of Henry V. was granted a patent to "Henricus Berton Valectus camerae Regis custos horologii Regis infra Palatium Westm pro vita. cum feod. VI den per diem." Henry VI. entrusted its custody to William Warby, Dean of St. Stephen's, together with sixpence a day remuneration. The tower was standing in the time of Elizabeth, for Judge Southcote mentions the tradition, stating that the clock still remained which had been made out of the Chief Justice's fine. The engraving which I am enabled to give of this interesting erection is from the *Mirror* (vol. xi.), which was published in 1825. The sketch is said to have been copied from an engraving by Hollar, who was born in 1607 and died in 1677. If this is correct, it doubtless represents the locality as it existed about the middle of the seventeenth century, shortly after which time the tower was pulled down, but the exact date of its destruction is uncertain.

On the old Houses of Parliament, which were destroyed by fire in 1834, a dial on the second pediment of the buildings in Palace Yard marked the site, the remarkable motto on which, "Discite Justitiam Moniti," may be taken to relate to its origin. The clock tower of the present home of our Legislature is, it is conjectured, but a few paces from the situation of the original clock. The great bell, "Tom of Westminster," was broken up and re-cast for the St. Paul's Cathedral clock, of which more particulars will be given later on.

There was a large clock in Canterbury Cathedral at the end of the thirteenth century, which, according to Dart's history of the sacred edifice, was put up at a cost of £30 in 1292, and one at Exeter at the beginning of the fourteenth century.

An "orologium" of some kind was under construction at Norwich Cathedral in 1323. From that date numerous entries relating to it occur in the Sacrist's Rolls. There were twenty-four small images, which it may be conjectured represented the hour of the day and night; thirty images, probably corresponding to the days of the month, and also painted and gilded plates portraying the sun and moon. About 1326 Richard Wallingford, Abbot of Saint Albans, placed "horologe" in his monastery, and the account which he gave of



FIG. 16.—Clock tower in Palace Yard, Westminster.

As machine is still preserved in the Bodleian Library at Oxford. From this, Wallingford's conception really appears to have been more of a planetarium for showing the course of the heavenly bodies than a timekeeper, for his description contains no mention of any escapement or regulator for ensuring equable motion.

The earliest clock worthy of our modern definition, of which we have any authentic details, is the one which is said to have been made about the year 1335, by Peter Lightfoot, an ingenious monk

of Glastonbury Abbey, for and at the expense of his superior, Adam de Lodbury, who was promoted to the Abbacy of Glastonbury in 1322 and died in 1335. The fourteenth century was distinguished by the introduction of the peculiar class of clocks which, besides indicating the flight of time, were furnished with mechanism for other purposes. One of the earliest of this kind was described by Viollet le Duc as having been given about the year 1340 to the monastery of Cluny by the Abbot Pierre de Chastelux. In addition to its indication of the phases of the moon, the movements of the sun, etc., this clock had a quantity of little figures which acted various scenes, as "The Mystery of the Resurrection," "Death," etc. The hours were announced by a cock, which fluttered its wings and crowed twice. At the same time an angel opened a door and saluted the Virgin Mary, the Holy Ghost descended on her head in the form of a dove, God the Father gave her His benediction, a musical carillon chimed, animals shook their wings and moved their eyes ; at last the clock struck, and all retreated within it.

From a horological point of view such marionette exhibitions are puerile and contemptible ; still they caught and held the popular fancy, their producers being as a rule more honoured than those who merely strove after exactness of timekeeping.

Horological construction of this kind was not confined to the Western part of Europe. Anent the wonders in the Palace of Abu Hammou, Sultan of Thencen, the Abbé Bergès, a French scholar and orientalist, speaks of a clock in the king's palace, ornamented by figures wrought in solid silver. Above the case containing the works was a scene representing a thicket in which was a bird spreading its wings over its young. A serpent stealthily crawled out of its hiding place towards the birds, endeavouring to surprise and devour them. Ten doors introduced in the forepart of the clock represented the ten hours of the night. At the end of each hour one of these doors creaked and shook. Two wider and higher doors occupied the lateral extremity of the case. Above these doors and near the cornice, a sphere of the moon moved in the direction of the equatorial line and indicated the course of this heavenly body. At the commencement of each hour, when one of the smaller doors rattled, an eagle swooped out of each of the two bigger doors and settled on a copper vase or basin, dropping into it a piece of metal—also copper—which they had carried in their beaks. These weights, which glided into a cavity introduced at the bottom of the vase, dropped into the interior of the clock, subsequently rising again

when required. Then the serpent, which by that time had wound itself up to the top of the thicket, emitted a sharp hiss, pounced upon and bit one of the young birds, its mother meanwhile squeaking and endeavouring to defend it. At this moment the door which marked the time opened by itself, a young female slave appeared, and in her right hand presented an open book whereon the name of the hour could be read in verses. She held her left hand up to her lips as if to salute a khalifa. This clock was named in Arabic *Menganah*, and was first seen in 1358.

The first of the celebrated Strasburg Cathedral clocks was begun about 1350, under the direction of John, Bishop of Lichtenberg. Henry de Vick, of Würtemberg, constructed a clock for Charles V. of France, surnamed the Wise, and it was erected at Paris in the Royal Palace (now the Palais de Justice) about the year 1370. Somewhat similar clocks were, probably about the same time, erected at Caen and Montargis, though some French writers assert that the Caen clock was made by one Beaumont in 1314. In Rymer's "*Fœdera*" there is printed a protection given by King Edward III. of England to three Dutchmen named John Lietuyt, John Uneman and William Uneman, who were "*Orologiers*," invited from Delft to England in 1368. The title of this protection is, "*De Horlogiorum Artificio exercendo*." There were probably also English artificers practising their craft at the same time as that of the issue of the decree which gave the Dutchmen protection, for that document enacted that the English artificers should not be molested. The "*horologium*" of John Dondi, constructed at Padua in 1344 by order of Hubert, Prince of Carrara, seems also to have been a true clock. It is described as being placed on the top of a turret on the steeple, and designating the twenty-four hours of the day and night. De Maizières, a contemporary writer, says it was visited by all the scientific men of the day, and from thenceforward the family of Dondi took the name of "*Dondi d'Orologia*." He also speaks of Joseph Dondi, apparently a son of John, as one who excelled in clockmaking, and after sixteen years' labour constructed a sphere or clock governed by a single balance, and which correctly showed the motion of the celestial bodies. John Visconti, Archbishop of Milan, set up a clock at Genoa in 1353; in 1356 one was fixed at Bologna.

Froissart has left a descriptive eulogium of a clock, written in 1370 in the form of a fragmentary poem, entitled "*L'Horloge Amoureuse*." In this the controlling medium is referred to as a "*foliot*," which

was doubtless the straight armed balance with weights such as appears in the drawing of De Vick's clock presently to be described. In 1389 a splendid clock, made by Jehan de Féalins, was erected at Rouen, which with some modern alterations to the movements is still a reliable timekeeper, showing the hours and also the days of the week and the phases of the moon. The handsome dial shown in Fig. 17 is about six feet square. At Spires, in Bavaria, there was a clock in the year 1395. Dr.

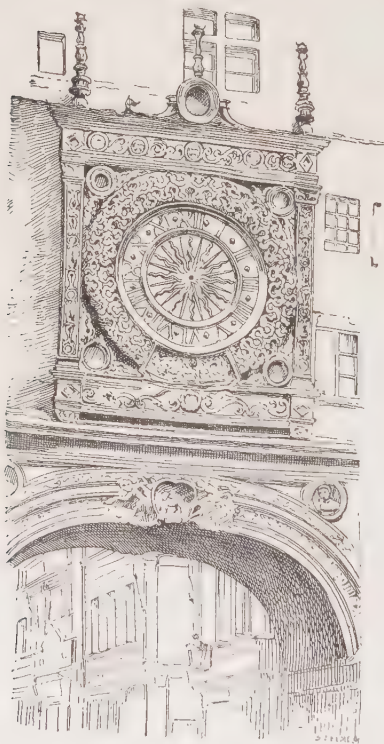


FIG. 17.—Clock at Rouen.
Dictionnaire de l'Amcublement.

Helein describes a complicated clock which at the end of the fourteenth century was erected at Lund, in Sweden. When the hours were struck, two knights came forward, and gave each other as many blows as the number of the hour; a door then opened and showed the Virgin Mary, seated on a throne with the infant Jesus in her arms. The Magi then presented their offerings, during which trumpets sounded, and the figures disappeared. From the beginning of the fifteenth century mathematicians, astronomers and mechanicians throughout Europe vied with each other in contriving timekeepers with various supplementary actions. In 1401 a large clock with bells was placed in the Cathedral of Seville, and in 1404 a similar one for Moscow was constructed by Lazare, a Servian. The clock

of Lubeek was made in 1405 and one at Pavia by G. Visconti a little later. In 1442 Nuremberg had a clock with figures to represent soldiers which went through evolutions periodically. The Auxerre clock was finished in 1483, and shortly after an astronomical clock was erected at Prague; the clock at Munich dates from the same period. The first monumental timekeeper in the Square of St. Mark's, Venice, was put up in 1495. Among clocks of

the sixteenth century may be cited one at Brussels, one at Berne, the latter constructed 1557 by Gaspard Brunner, having performing soldiers something in the style of the Nuremberg one, "Hans of Jena," in which a pilgrim offered an apple to an immense open-mouthed grotesque head as the hours struck, but quickly withdrew it before the mouth could be closed; the clock at Coblenz where, in the belfry of the Kaufhaus, was fixed a large helmeted head, the mouth of which opened and shut as the hours were sounded; an astronomical clock at Beauvais Cathedral of thirty-six feet in height and having fifty dials; the second great Strasburg clock which was begun in 1570; a clock with numerous mechanical figures set up at Niort, in Poitou, the same year; a clock at Calais with two figures which attacked each other as in the Lund clock, and the celebrated Lyons clock which dates from 1598. These are but some of the more notable clocks erected up to the close of the sixteenth century, by which time nearly every town in Europe had at least one public timekeeper of some pretensions. Of several typical ones among those enumerated I am enabled to give fuller particulars.

The Glastonbury ancient and complicated piece of machinery was, according to William of Worcester, originally in the south transept of the abbey church; but it was removed with all its appendages from thence to Wells Cathedral at the time of the dissolution of the monastery in the reign of Henry VIII., where, in an old chapel in the north transept, it still remains. The face of the clock as it now appears is shown in Fig. 18. The dial is six feet six inches in diameter, and contained in a square frame, the spandrels of which are filled with angels, holding in their hands each the head of a man. The outer band is painted blue, with gilt stars scattered over it, and is divided into twenty-four parts, corresponding with the twenty-four hours of the day and night, in two divisions of twelve hours each. The horary numbers are painted in old English characters on circular tablets, and mark the hours from twelve at noon to midnight, and from thence to twelve at midday again. The hour-index, a large gilt star, is attached to the machinery behind a second circle, which conceals all except the index. On this second circle are marked the minutes, indicated by a smaller star. A third and lesser circle contains numbers for indicating the age of the moon, which is marked by a point attached to a small circular opening in the plate, through which the phases of the moon are shown. Around this aperture is an inscription, not

very intelligible, which one author reads as "*Ab hinc monstrat micro . . . ericus archery pung,*" meaning, probably, that in this microcosm were displayed all the wonders of the vast sidereal hemisphere. Corresponding to the moon aperture on the opposite side of the centre is a circle, in which is a female figure, with the motto "*Semper peragrat Phœbe.*" An arched pediment surmounts the whole, with an octangular projection from its base line, forming a cornice to the face of the clock. A panelled turret is fixed in the

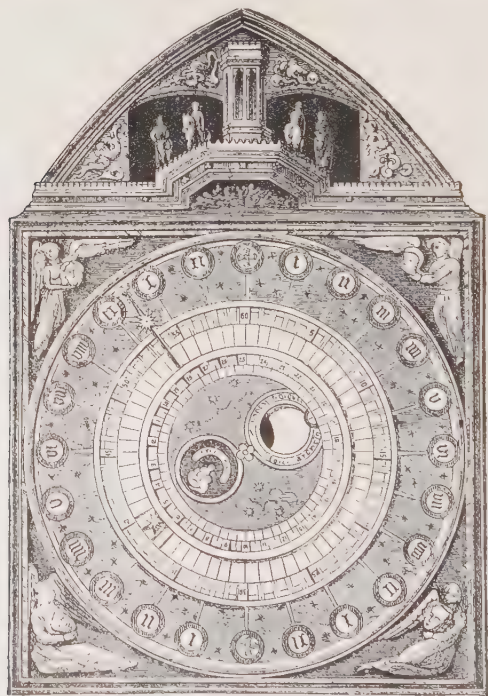


FIG. 18.—Dial of Glastonbury clock.

centre, around which four equestrian knights, equipped for a tournament and mounted on two pieces of carved wood, used to revolve in opposite directions, two on each side, as if running at the ring in a tilt, when set in motion by a connection with the clock. The figure of a man seated at one angle of the transept, within the church, is connected by rods with the clock, and he is made to strike the quarters with his feet on two little bells, and the hours on another bell before him with a battle-axe that is in his hands. If the date of the construction of the clock be correct, the figures at

present moved by its machinery cannot, according to Mr. Planché, be the original ones, or they have undergone strange alteration. Those that circulated in a sort of tilting match are very clumsily carved, and have suffered some injury from time ; but two of them appear to be intended for jesters ; one wears a hood with ears to it ; the third is a nondescript ; but the fourth is painted in the civil costume of the reign of James or Charles I., with falling collar,

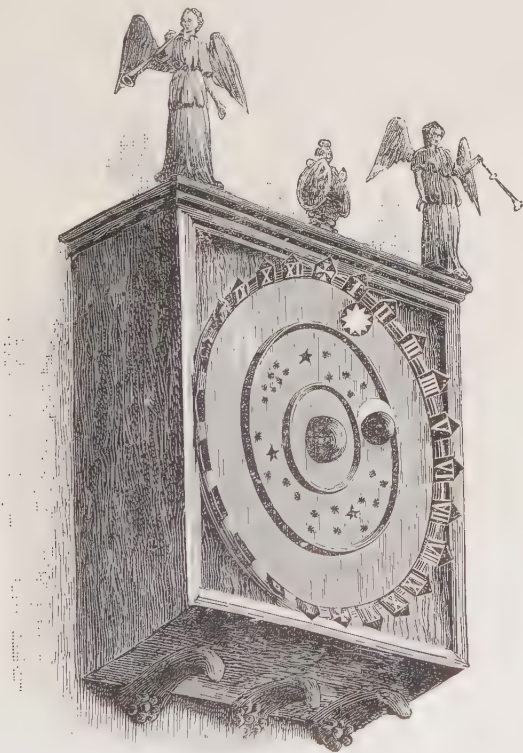


FIG. 19.—Dial of Wimborne clock.

striped doublet, and the peaked beard and moustache of that period. Two figures that strike the hours on a bell on the outside with their battle-axes are in armour of the fifteenth century, and the time of Henry VI. or Edward IV.

The old interior works of this clock were of iron, not differing materially in principle from the mechanism of much later date clocks, except that the appliances for the variety of the movements

of the dial-plate were necessarily complicated. They exhibited a rare and interesting specimen of the art of clockmaking at so early a period, in which the monks particularly excelled. After going for nearly five centuries, the works were found to be so completely worn out that, about the year 1835, they were replaced by a new train. The old movement, now controlled by a pendulum, may be seen in action at South Kensington Museum. Except for the quarter striking part and the lutation work, the movement is identical with that of De Vick's clock, presently to be described.

Another clock attributed to Lightfoot was erected at Wimborne in Dorsetshire. The dial as it at present appears is represented in Fig. 19, and an examination will show many features in common with these two fourteenth-century clocks.

Figs. 20, 21 and 22 represent De Vick's clock in front and in profile.

There was but one hand, and that in its revolution round a dial-plate indicated the hours. A heavy weight tied to a rope, which was wound round a cylinder or barrel, served as the power to cause the hand to revolve; but the hand, instead of being fixed to the axis of the barrel, had its motion communicated through a wheel and pinion, so that the weight did not need to be wound up so frequently as would otherwise be the case. If the weight were freely subjected to the influence of gravity, its motion would have been accelerated, and so an escapement and controller had to be devised in order that all the spaces traversed by the hand should be passed through in the same time as each other. The device adopted to check the progress of the weight was as follows: Connected with the arbor carrying the hand is a spindle carrying a wheel with ratchet-shaped teeth, as will be seen from Fig. 20. This wheel, called the "escape wheel," has an odd number of teeth, and on a vertical rod or "verge" are two beds or "pallets," of a distance from each other equal to the diameter of the wheel. The acting faces of these pallets form nearly a right angle, and the verge is planted close to the teeth of the wheel, so that one of the projecting pallets is always intercepting the path of the wheel teeth. In this way an alternating rotary motion is imparted to the verge, the escape wheel slipping by a space equal to half the distance between two teeth at every alternation. The action of the teeth of the wheel on the pallets will perhaps be better understood by a reference to Fig. 23, which is a plan to an enlarged scale. A tooth of the escape wheel is just leaving the upper pallet (*c*); as it drops

off, the under tooth will reach the root of the lower pallet (*d*), but the motion of the verge will not be at once reversed. The escape wheel will recoil until the impetus of the balance is exhausted. The

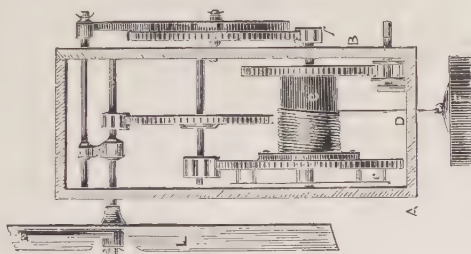


FIG. 22.—Side view of striking part.

F, weight; A, B, plates; C, barrel; C, pins for raising the hammer; J, fly; J, pinion for driving wheel; N, count wheel or locking plate; I, lever for letting off striking work.

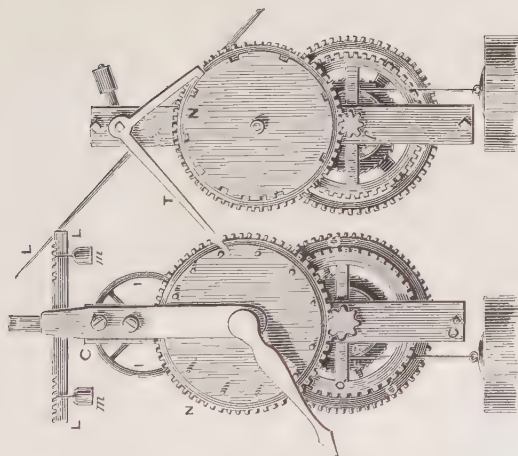


FIG. 21.—Front view of De Vick's clock.

K, verge; L, balance; m, shifting weights for adjusting the clock to time; b, pinion driving hour wheel; N, hour wheel, the arbor of which carries the hand.

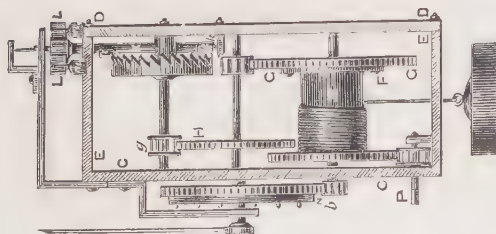


FIG. 20.—Side view of going part.

B, barrel; C, D, E, plates; F, ratchet and click; G, great wheel; P, O, winding pinion and wheel; H, second wheel; G, escape pinion.

teeth of the wheel are undercut to free the face of the pallet during the recoil.

Mounted on the top of the verge is a cross-bar, on each end of

which is a weight. The inertia of the cross-bar and weights, by opposing the rotary motion, forms the regulator, and as the centre of gyration may be altered by shifting the weights along the bar, the time occupied by each vibration may be increased or lessened, as may be required. This controller, admirable as it was, did not give anything like the exact result now attained by means of a superior escapement and the pendulum, for its constancy was seriously affected through variations in the motive force, such as would be caused by deterioration and thickening of the lubricant used to the pivots and bearing surfaces. It is, however, curious to note that the balance of a modern chronometer or watch, which vibrates with such marvellous accuracy, is analogous in its action to that of the early cross-bar regulator.

To understand the way the weight was raised after the rope was

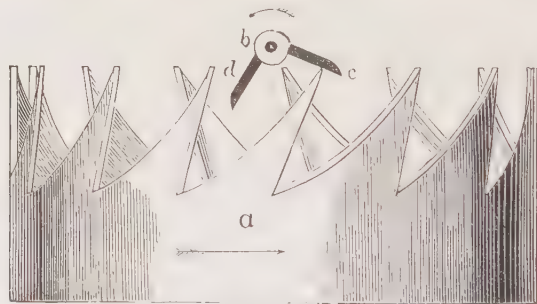


FIG. 23.—Verge escapement. *a*, wheel; *b*, verge.

uncoiled from the barrel, it may be necessary to explain that, though the great wheel is tight on its arbor, the barrel on the same arbor is loosely fitted, the connection between the two being established by means of a ratchet-wheel and click. To lessen the labour of winding, a wheel is attached to the barrel, into which a pinion gears, and on the squared extremity of the pinion arbor the winding handle is placed. The different parts are shown and lettered in Fig. 20.

The manner of striking the hours in regular order will be apparent from Figs. 21 and 22, with a little explanation. The striking part of the clock is distinct from the going part, and is actuated by a separate weight. It occupies the right in Fig. 21. The wheel to which the hand is attached turns once in twelve hours, and it will be observed that, projecting from its face, are twelve pins, equidistant from each other. Although continually

solicited by the weight, the striking train of wheels cannot turn except once at each hour, because it is locked by a tooth at one extremity of a "bell-crank" lever, T, engaging with one of a series of notches in the locking-plate, N. At the completion of each hour this tooth is lifted out by one of the twelve pins depressing the other end of the lever, and the striking train then rotates till the tooth of the lever falls into the next notch of the locking-plate. The tail of the hammer which strikes the bell intersects the path of the lifting pins, *c*, which are arranged around the great wheel of the striking train. The notches around the edge of the locking-plate are placed at such distances that at one o'clock the tooth enters a notch directly one blow has been struck on the bell. At the next hour there is a longer space before a notch is reached, and so two blows are struck before the train is again locked; at the succeeding hour the space permits of three blows, and so on, till at twelve o'clock the plate has made a complete rotation, and the action of the preceding twelve hours recurs. The striking train would run down with increasing velocity but for the fan L, which keeps the periods between the strokes of the bell practically uniform. This is the principle of the striking work still used in most turret clocks, and till recently in nearly all small clocks of French make. The chief objection to it is that the hours are struck in regular progression without reference to the position of the hands; so that if the striking part happens to run down before the going part, the striking will be all wrong when it is started again, unless the precaution has been taken to set it going at the same hour as that at which it stopped.

Fig. 24 shows the dial of De Vick's clock and its splendid surroundings, adjoining the side of the Palais de Justice, which faces the Quai aux Fleurs. Though the clock appears to have been erected in the round tower of the palace in 1370, the present architectural environment was not completed till 1585. The engraving is from "*Les Merveilles de l'Horlogerie*." The figures of Piety and Justice flanking the dial, and the angels supporting the coat of arms which crowns the pediment, are by Germaine Pilon. On the upper tablet is the inscription, "*Qui dedit ante duas triplicem dabit ille coronam*." The panel below the dial perpetuates the quotation from *Passerat* :—

" Machina que bis sex tam juste dividit horas,
Justitiam servare monet legesque tueri."

This celebrated clock has experienced several long intervals of

neglect, and been many times repaired. In 1852, after thorough examination, its defects were made good, and it was in some

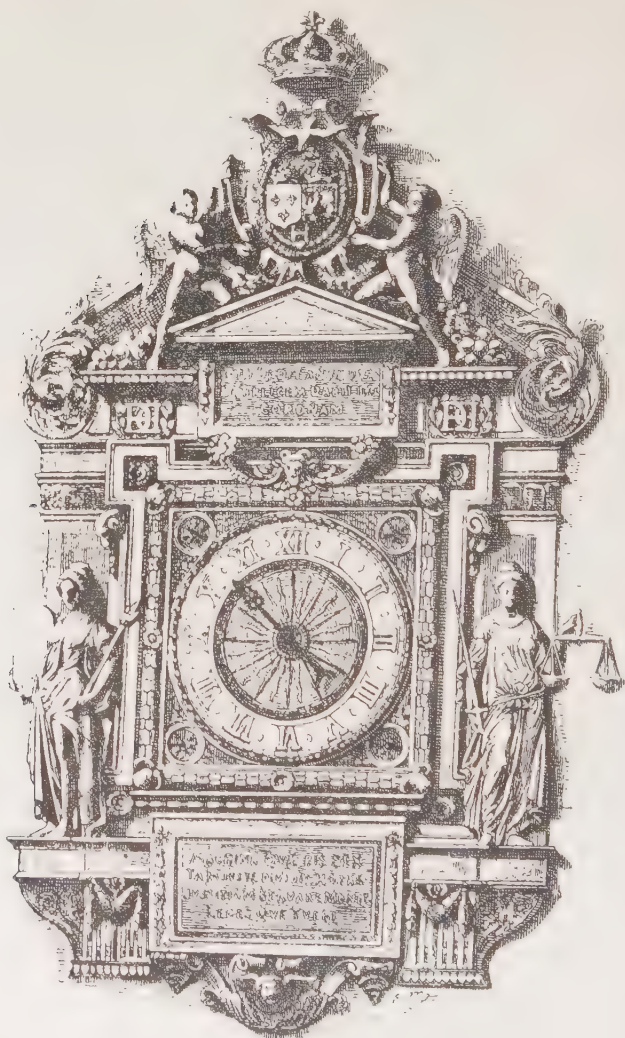


FIG. 24. Clock of the Palais de Justice, Paris.

measure reconstructed. The bell on which the hours are struck was cast by John Jouvance, and it is said that upon this bell was repeated the signal from St. Germain l'Auxerrois for the massacre

of St. Bartholomew in 1572. The bell for the Montargis clock was also made by Jouvance.

A turret clock was also erected at Dover Castle in the fourteenth century. This is still in action at South Kensington Museum. In construction it is somewhat similar to Lightfoot's and de Vick's. On the wrought-iron frame are the letters R.L. arranged as a monogram. The train, however, consists of only one wheel, which drives the escape-pinion so fast that there must have been either a very long driving-cord, or the clock must have been wound at frequent intervals. The winding is accomplished by means of handles or spokes projecting radially from one end of the barrel, which runs freely on the arbor of the wheel. On the face of the barrel which is nearest the wheel is a spring click, catching into the arms of the wheel, the arms thus serving the purpose of a ratchet. This click and ratchet arrangement was long favoured by some makers, and is often found in lantern clocks of the seventeenth century. The wheels of these early clocks were of wrought iron, the arms being riveted into the rim. A clock very similar to the Dover one was erected at Peterborough about the same date.

Exeter Clocks.

Few places probably can show more interesting relics of primitive horology than Exeter. "From the patent rolls of Edward II.," the late Mr. Britton observes, in his description of Exeter Cathedral, "it is evident there was a clock in this church in 1317. In the fabric roll under the year 1376-77, the sum of 119s. 9d. is set down for expenses '*circa cameram in boreali turre pro Horlogio quod vocatur clock*—(this appears to be the earliest mention of the word)—*de nove construendam.*' The whole charge in the roll '*nova camera pro horologio*' is £10 6s. 5½d. In the same rolls we find repeated entries relative to the clock. In 1424-25, two men were sent off on horseback to fetch Roger, clockmaker, from Barnstaple."

Whatever its construction, no trace of the original horologe can be found, but of its successor, stated to have been presented by Bishop Courtenay in 1480, the wrought-iron framing and the great wheel are preserved, and were quite recently to be seen in the Chapter House. It is stated that this clock was made by Peter Lightfoot, but if the date of its construction (1480) is correct, this cannot be true, for Lightfoot had then been dead some years. The dial which still does duty bears a resemblance to the one of Lightfoot's at Glastonbury, from which it was possibly copied. It shows the

hour of the day, and the age of the moon ; upon the face or dial, which is about seven feet in diameter, are two circles, one marked from one to thirty for the moon's age, the other figured from I. to XII. twice over, for the hours. In the centre is a semi-globe, representing the earth, round which a smaller ball, the moon, painted half white and half black, revolves every month, and in turning upon its axis shows the varying phases of the luminary

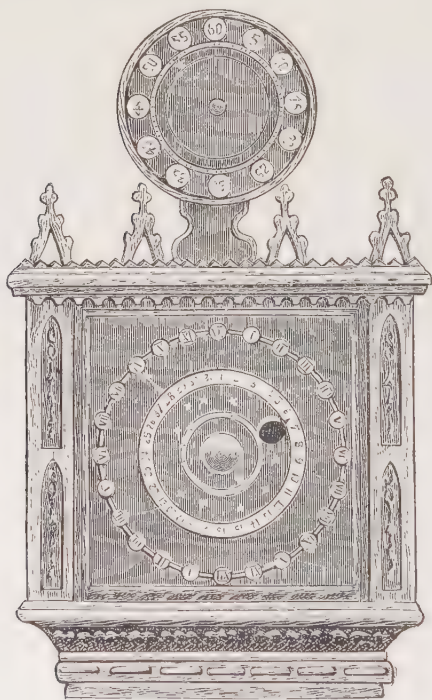


FIG. 25.

which it represents ; between the two circles is a third ball, representing the sun, with a *fleur de lis*, which points to the hours as the sun, according to the ancient theory, daily revolved round the earth. Underneath it is the inscription, "Pereunt et imputantur" (they [the hours] pass and are placed to our account). In 1760 the clock was thoroughly repaired by William Howard, when an additional dial to show the minutes was provided and placed on the top of the case as shown in Fig. 25. The movement was replaced by a modern one in 1885.

The hours are still struck on "Great Peter," a fine-toned bell in the north

tower. This bell was the gift of Bishop Courtenay, and was brought from Llandaff (1478-1486). According to Worth's excellent Guide to Exeter Cathedral, it was recast in 1676 by Thomas Perdue. Its weight, as computed by the Rev. H. T. Ellacombe, is 14,000 lbs., its diameter at the mouth 76 inches, and its height 56 inches.

In the tower of the Church of St. Mary Steps, near by where once stood the old West Gate, is a most curious clock, which is probably a production of the sixteenth century. The dial is embellished with basso-relievos representing the four seasons. In

an alcove over the dial are three automatic figures. The centre one is the statue of Henry VIII. in a sitting posture, which, on the clock striking the hour, inclines the head at every stroke. On each side is a soldier in military attire, holding a javelin in one hand and a hammer with a long handle in the other. These soldiers strike the quarters by alternate blows on two bells beneath their feet.

The three figures are termed by many Exonians "Matthew the Miller and his two sons," from the fact that "Matthew the Miller," who resided in a place known as Cricklepit Lane, was remarkable for his integrity and regular course of life. His punctuality of going at one hour for and returning with his grist led his neighbours to judge with tolerable exactness the time of day from his passing. By this the statue received its vulgar name.

Some years ago the following distich used to be current in Exeter :—

Matthew the Miller's alive,
Matthew the Miller is dead,
For every hour in Westgate
Tower
Matthew nods his head.

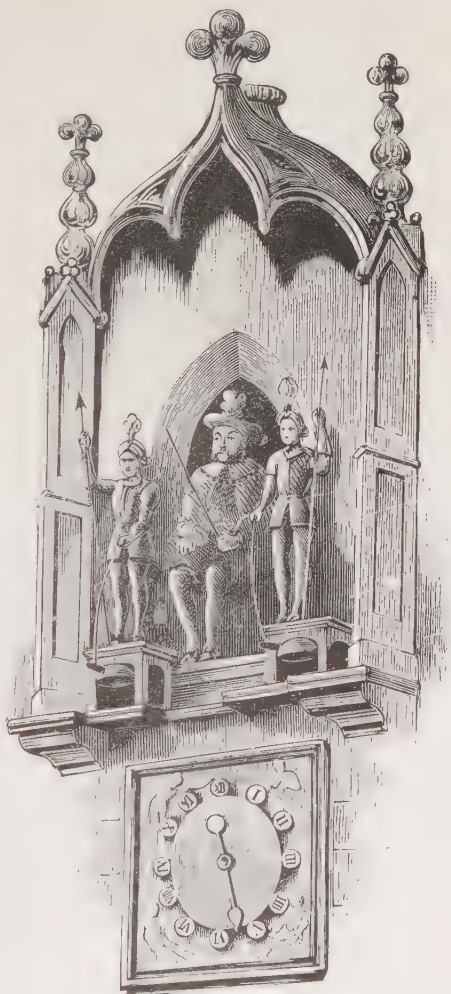


FIG. 26.

Another old clock is contained in the tower of St. Petrock's Church, in the High Street. This timekeeper is believed to date from 1470. In the tower also is a peal of six bells, the oldest of which bears the arms of Henry V. or VI., not later than 1425.

**St. Mary's
Church,
Oxford.**

There was a clock at St. Mary's Church, Oxford, in the fifteenth century, for references are made to it in the proctor's accounts. Under date 1469 is "Pro custodia horilogij vjs. viij*d.*," and a somewhat similar entry occurs in 1473. In 1523 a new clock was erected from fines imposed on negligent students. In the vice-chancellor's accounts from 1550 to 1554 is an item, "Paid to Thos. Masey for mendinge St. Maryes clocke, 25 Junii, travellinge (travailing) by the space of two weekes thereon, and was moreover paid the sum of tenpence for a clock for the said machine." On some parchment rolls in the tower of the schools, among the proctor's accounts, appears, "1469, Pro custodia horilogii, iij*s.*," and "1472, Pro reparatione horilogij, vjs. viij*d.*"

Although details are in most instances wanting, there are sufficient references among the ecclesiastical records of the country to show that church clocks were pretty general throughout England in the fifteenth century. According to the churchwardens' accounts for Walberswick, in Suffolk, 11*d.* was paid to the clockmaker in 1451, and 12*s.* 8*d.* in the following year. In 1495, John Payn, the smith, of Southwold, received 6*s.* 8*d.* for a new clock, and in 1499 Nicholas Schrebbys was paid four sums—1*l.* 13*s.* 4*d.*, 6*s.* 8*d.*, 1*l.* 2*s.*, and 13*s.* 4*d.*—for the clock.

John Baret, of Bury St. Edmunds, by his will dated 1463, bequeathed 8*s.* yearly to the sexton of St. Mary's Church, "To keep the clokke, take hede to the chymes, wynde vp the peys and the plummeys as ofte as nede is"

The records of Dunstable mention a clock over the pulpit in 1483, and the churchwardens' accounts of Wigtoft, Lincolnshire, refer to several sums paid to Richard Angel for keeping the clock from 1484 onward.

An old clock at York Cathedral, which was fixed to the wall near the south door and covered with a large Gothic case, was removed in 1752, when the present clock, made by John Hindley, was erected.

**Strasburg
Clocks.**

The first clock set up in the interior of the cathedral at Strasburg was begun in 1352, and completed two years after, under John, Bishop of Lichtenberg. It consisted of a calendar, representing in a painting some indications relative to the principal movable feasts. In the middle part there was an astrolabe, whose pointers showed the

movements of the sun and moon, the hours, and their subdivisions. There was placed at the same elevation the prime mover, and the

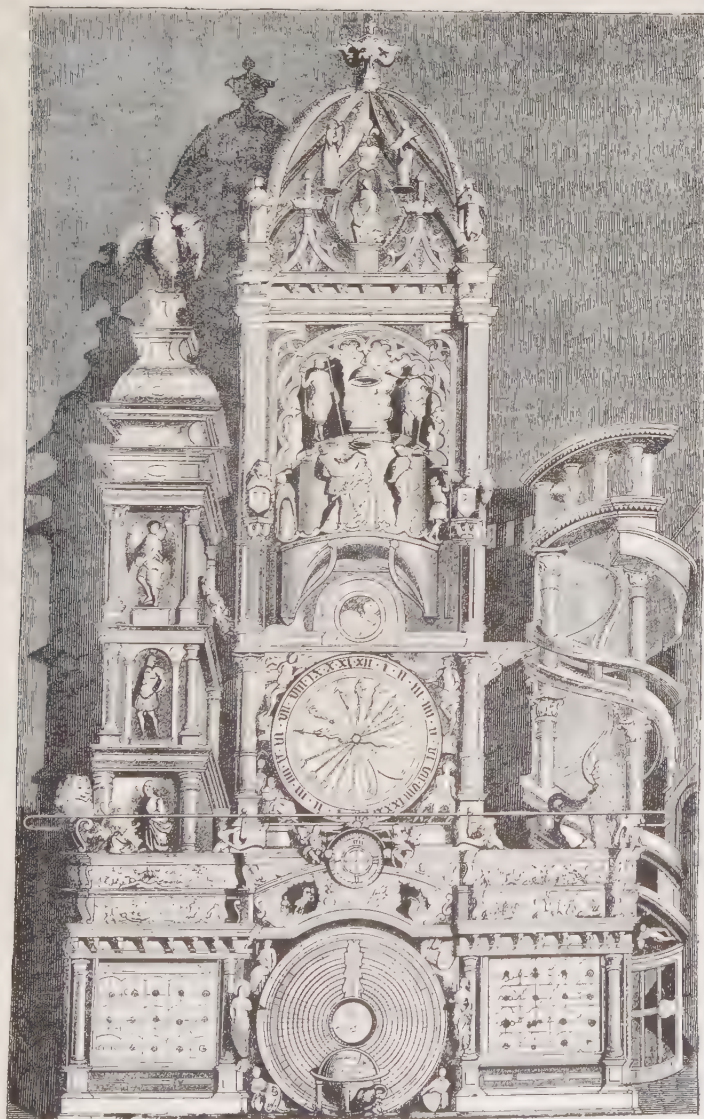


FIG. 27.—The second Strasburg clock.

other wheel work which caused the clock to go. The upper compartment was adorned with a statuette of the Virgin, before which,

at noon, the three Magi (wise men of the East) bowed themselves. An automaton cock, placed upon the crown of the case, crowed at the same moment, moving its beak and flapping its wings. A small set of chimes, composed of several cymbals, formed a part of this work.

The Second Clock,

of which an exterior view is given on page 37, was certainly a triumph of ingenuity. It was projected in 1547; but though the designs appear to have been then ready, the execution went no further than the building of the chamber and the preparation of some of the heavier ironwork, till 1570, when Conrad Dasypodius, a native of Strasburg, undertook to supervise the completion of the horologium. By his advice the mechanical works were confided to Isaac and Josiah Habrecht, mechanicians of Schaffhausen, in Switzerland, while Tobias Stimmer, of the same place, was employed to do the paintings and the sculpture which were to serve as decorations of the achievement.

Before, and at the foot of the clock, there was a celestial globe supported on four columns of wood richly carved. It performed a revolution on its axis, showing the stars known in the time of Ptolemy, about A.D. 140. These stars, to the number of 1020, were grouped in forty-eight constellations, represented by as many figures. Two circles, one carrying the sun and the other the moon, turned round the globe, the first in twenty-four hours, the second in the space of about twenty-five hours.

Immediately behind the celestial globe there was a large wooden disc, in which was painted a calendar for the space of a century, the months, the days, the Dominical letter, the names of the saints, and the dates of the principal movable feasts. This calendar made an entire revolution every year. The statues of Apollo and Diana, placed on two sides of the disc, pointed out, with their sceptres, the one the day of the year, the other the corresponding day at the end of six months. The central part of the calendar was immovable; on it were represented the countries of Germany situated along the Rhine and the topographical plan of the city of Strasburg.

The compartments on each side of the calendar were occupied by large panels upon which were painted the principal eclipses of the sun and moon visible in the northern hemisphere, and answering to the interval of thirty-two years from 1573 to 1605.

Above the calendar there were seen in the clouds the seven pagan

divinities that have given their names to planets, and afterwards to the days of the week. These allegorical figures, seated in cars, each one drawn by the animals which mythology assigns to that particular divinity, showed themselves successively on the days which were sacred to them. On Sunday, Apollo was seen, this day being dedicated to the sun. The ancients named it *Dies solis* (the day of the sun), and the Christians the Lord's day (*Dies Dominica*), whence is derived the French word, *Dimanche*, for Sunday. A representation of Diana was shown on the second day, which was called *Dies luna* (day of the moon)—*Lundi*—Monday. Mars, the god of war, appeared on (*Mardi*) Tuesday, the English word being derived from *Tuesco*, the Saxon name of the god of war. The fourth day was represented by Mercury, the messenger of Olympus; French, *Mercredi*; English, Wednesday (the latter being derived from *Wodin*, the Saxon name of the same deity). The following day *Dies Jovis*, Jupiter's day; French, *Jeudi*; English, Thursday (derived from *Thor*, the Saxon name for Jupiter). Venus succeeded on Friday (which in English is derived from *Friga*, the Saxon name of the goddess Venus). Saturn, the god of time, came on Saturday, to close the Olympian procession.

Immediately above the divinities of the week was erected a gallery, in the middle of which a small dial plate indicated the quarter-hours and the minutes, the hours being represented upon the astrolabe; at the sides of the dial plate were seated two genii, of which the one placed on the right raised a sceptre each time the hour was to strike, and of which the other at the same moment turned upside down an hour-glass which he held in one hand, turning it always in the same direction. An astrolabe, constructed according to Ptolemy's system, occupied the greater part of the middle story, in the interior of which was contained the wheel work of the clock. Six pointers, bearing the same number of planets, pointed out, upon twenty-four divisions of the astronomical day, the movements of these heavenly bodies; one pointer, larger than the others and terminated by a sun, finished in twenty-four hours an entire revolution round a small map of the world placed in the central part of a large dial plate, which was ornamented at the same time by the circles of a horoscope and by the twelve signs of the zodiac. The upper part of the astrolabe was crowned with the phases of the moon. There was visible a small dial plate cut in its lower part by two semicircles, behind which the moon, represented by a golden disc, disappeared at the time of the new moon, and came out from day to day to show

successively a quarter part of its orb, till it presented to view its entire disc, at the time of full moon.

At the third story of the clock there was a platform, upon which were fixed four small statues representing the four periods of life—infancy, youth, manhood, and old age; these figures struck the quarter-hours upon cymbals.

Above this platform was suspended the bell intended for sounding the hours. Two figures stood beside this bell; the one was Death under the form of a skeleton, the represented Christ, having in one hand the cross and the palm branch. At the instant the hour ought to strike, the Saviour came forward, and the skeleton drew back; but hardly had this movement taken place when Christ retreated precipitately, and Death advanced in the same way, to strike on the bell the number of strokes required. This movement was repeated as many times as there were strokes in the hour.

The structure of the second clock was retained to encase the mechanism with but slight alteration. It is over twenty feet in height, and is surmounted by a remarkably handsome dome, as shown on page 37. On the right is a spiral staircase, by means of which the various galleries are reached.

The turret, placed on the left of the principal edifice, contained the weights of the clock, as well as the machinery intended for the cock which was perched on the summit of this turret. This cock (the only piece which was preserved from the first clock, called the clock of the three kings) crowed at first daily, at noon, flapping its wings and opening its beak; but having been struck with lightning in 1640, it was made to crow only on Sundays and feast days. It ceased crowing entirely in 1789, at the time when overwhelming attention bestowed upon the great events that were taking place caused it to be completely forgotten.

Third Stras- burg Clock.

At length it was evident that some reconstruction was necessary. After considerable debate, the necessary work was entrusted to Jean Baptiste Schwilgue, who entered on his task in 1838, and completed it about the middle of 1842. On the 2nd of October of that year the life of the resuscitated marvel was solemnly inaugurated. Some of the former actions were altered or omitted, and fresh ones added, the greater part of the movement being entirely new, for only in some few cases was a restoration of the former mechanism practicable.

The motions now are briefly as follows:—On the floor-level is a

celestial globe, indicating sidereal time. In its motion round its axis the globe carries with it the circles that surround it—namely, the equator, the ecliptic, the solstitial and equinoctial colures, while the meridian and horizon circles remain motionless, so that there are shown the rising and setting, as well as the passage over the meridian of Strasburg, of all stars that are visible to the naked eye, and which appear above the horizon. Behind the celestial globe is the calendar; on a metallic band, nine inches wide and thirty feet in circumference, are the months, the days of the month, Dominical letters, fixed and movable feast days. The band is shifted at midnight, and a statue of Apollo points out the day of the month and the name of the saint corresponding to that day. The internal part of the annular band indicates true solar time; the rising and setting of the sun; the diurnal motion of the moon, round the earth, and its passage over the meridian; the phases of the moon, and the eclipses of the sun and moon. Adjacent compartments are devoted to a perpetual calendar, solar and lunar cycles, and other periodic recurrences, solar and lunar equations, etc. Above the calendar appear allegorical figures, seated in chariots, and representing the days of the week. These chariots, drawn by such animals as are assigned as attributes of the divinities, run on a circular iron railway and appear each in order.

The dial for showing mean solar time is in the gallery above, called the Gallery of Lions. A genius stands on each side of the dial. The one on the left strikes the first note of each quarter-hour with a sceptre he holds in his hand, the second note being struck by one of the four ages in a still higher gallery, as will be described presently. At the completion of each sixty minutes the genius on the right of the dial reverses an hour-glass filled with red sand.

The story above is occupied by a planetarium, in which the revolutions of the planets are represented upon a large dial plate.

Above the planetarium, and upon a star-decked sky, is a globe devoted to showing the phases of the moon.

Next come movable figures representing the four ages, one of which in turn appears and gives upon a bell the second stroke of each quarter of an hour. At the first quarter a child strikes the bell with a rattle; a youth in the form of a hunter strikes it with an arrow at the half-hour; at the third quarter the blows are given by a warrior with his sword; at the fourth quarter an old man produces the notes with his crutch. When he has retired a figure of Death appears and strikes the hour with a bone.

In the upper apartment is a figure of Christ ; and when Death strikes the hour of noon the twelve Apostles pass before the feet of their Master, bowing as they do so. Then Christ makes the sign of the cross.

During the procession of the Apostles, the cock perched at the top of the weight-turret flaps his wings, ruffles his neck, and crows three times.

In addition to the mean time dial in the gallery, there is one, seventeen feet in diameter, above the principal entrance to the cathedral.

A most remarkable clock was in 1405 erected in the church of St. Mary at Lübeck. Doubtless it has been much altered since that time ; but in 1820, from the description of Downes, it was in good order. It consists of three compartments, the lowest of which contains the original inscription :—

Lübeck

Clocks.

“Hoc horologium factum est primum, Anno MCCCCV,
Hanc. rempl. gubernantibus Dn. Proconsulibus Henrico
Westof et
Goswino Clingenbergh, Provisoribus hujus ecclesie. Ipso die
purificationis Mariæ.

Aspectum cœli, Solis Lunæque nitorem,
Lumina per certos ignem ducentia cursus,
Ut fluat hora fugax, atque irrevocabilis annus,
Hoc tibi, conspiciens ! oculis haurire licebit.
Sed resonos quoties modulos campana remittit,
Pronus astripotens Numen laudare memento.”

These lines may be translated as follows :—

“This horologe [clock] was first made in the year 1405. The lord pro-consuls of this state, H. Westof and G. Clingenbergh, being overseers of this church. In the very day of the Purification of the Virgin Mary.

“The aspect of the heavens and the gleam of the Sun and Moon—luminaries drawing their light through certain courses, as flows the swift hour and irrevocable year, to thee, O beholder, will it be permitted to take in with thine eyes. But as often as the bell with resonant sounds [beats upon thine ears] remember in reverent attitude to praise the starpotent deity.”

There are also several other inscriptions recording the different dates at which the clock underwent repair.

The principal division of the compartment is occupied by a plate on which several concentric circles are described. This has a progressive motion, and is calculated to exhibit the various details of the calendar from 1753 to 1875, such as the Sunday letters, the days of the week and month, the hours of sunrise, the golden number, the solar circle, the day of Easter full moon, and the number of

weeks intervening between Christmas and Shrove Tuesday. The centre plate contains a specification of all the solar and lunar eclipses visible at Lübeck between the years 1811 and 1860, drawn up by the celebrated Bode, of Berlin.

In the middle compartment another plate is inserted, containing an hour circle, a movable zodiac, and a dial which points out the hours and the solar place in the ecliptic. A gilt representation of the sun, accompanied by the inferior planets Venus and Mercury, appears on the dial. There are four other dials respectively calculated for Saturn, Jupiter, Mars, and the moon. On two side columns the planetary hours are marked.

The highest compartment contains a small tower, with a set of bells which play every hour, and a clock which is struck by a figure of Time, while on the opposite side, that of Transiency, which, as here personified, reverts its face at every stroke. Under this tower is the figure of our Saviour, before which a procession, representing the emperor and the seven electors, passes at twelve every day, entering at one side, and retiring at the other. The first-mentioned figure bestows a blessing on those of the potentates as they move by, which express adoration by bowing the head. Two angels always announce the ceremony by sound of trumpet. An attendant stands before each of the little doors through which the train appears and disappears, and pays obeisance as they pass. The number of figures amounts to twelve; hence some people have considered that they represent the Apostles.

The sides of this stupendous horologe, which is enclosed by an iron railing, exhibit various scenes from the narrative of Christ's sufferings; and carved in the corner of the framework surrounding one of these scriptural pieces is the figure of a mouse, which is the work-mark of Lübeck.

Downes describes another extraordinary clock at Lübeck, in the Dome Church. This is of a much later date. The dial plate represents the face of the sun, the eyes of which, turning alternately to the right and left with the oscillation of the pendulum, produce a most hideous effect. Above are two figures, one of which personifies Faith, and beats the quarters; the other a skeleton, said to represent Time, exhibits rather the lineaments of Death. In the left hand it holds an hour-glass, and in the right a hammer, with which it strikes the hours, slowly moving the head to the right and left during the process.

Whatever variations were made in the form or size of clocks

during the fifteenth century, the principle of the mechanism remained unaltered, and such as were constructed appear to have been mostly for public buildings or persons of exalted position.

The fact that small clocks and portable clocks are mentioned as existing in the fourteenth century, seems to have led to the supposition that the mainspring as a motor was then in use, but such a conclusion is unwarranted. Most of these descriptions, or rather references, though interesting are of the vaguest character,

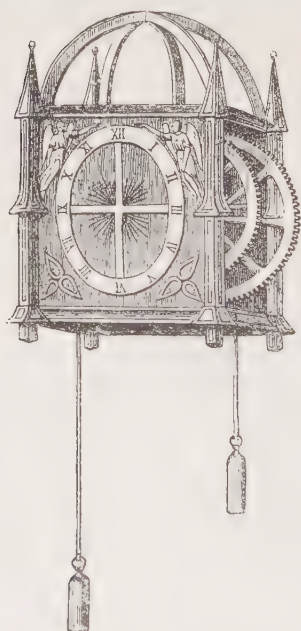


FIG. 28.—Chamber clock fifteenth century. Bib. Nat. de Paris.

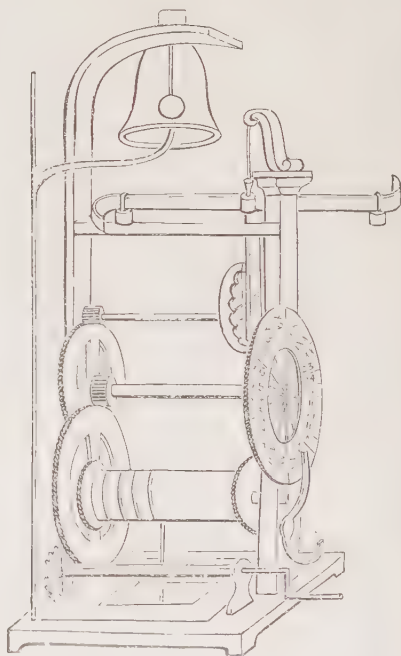


FIG. 29.—Fifteenth century clock from Italian tarsia-work.

for instance, among the ancient inventories quoted by M. de Laborde are "A.D. 1380, a clock of silver, entirely without iron"; and "a clock of white silver for placing on a column."

Sir John Paston, in the course of a letter written in the spring of 1469, says: "I praye you speke wt Harcourt off the Abbeye ffor a lytell clokke whyche I sent him by James Gressham to amend and yt ye woll get it off him an it be redy, and send it me, and as ffor mony for his labour, he hath another clok of myn whiche St. Thoms Lyndes, God have hys sowle, gave me. He maye kepe that

tyll I paye him. This klok is my Lordys Archebyssshopis but late him not wote off it."

The appended Fig. 28, from the Bibliothèque Nationale de Paris, purports to represent the remains of a fifteenth-century chamber clock. It is pretty evident there was originally a bell at the top of the case, and perhaps a hand to indicate the hour. It is not however certain there was a hand, for some of the early clocks had revolving dials. In the South Kensington Museum there is on a "tarsia," or inlaid wood panel of Italian late fifteenth-century production, a representation of a clock with a revolving ring, on which the twenty-four hours are marked, the current hour being indicated by a fixed pointer, as seen in Fig. 29. The whole panel represents an open cupboard, in which there are, besides the clock, a flagon, a chalice, a cross, etc.; so one may infer that the clock was of comparatively small size, and of course of older date than the panel, which careful comparison by the experts of the Museum fixes at *certainly not later than 1500*. The action of the winding work is obscure, but with that exception the construction of the clock is tolerably clear.

"deviser of the King's horologies and astronomer"

Nicholas to Henry VIII., was a Bavarian, born in 1487, who
Cratzer, it is said resided for thirty years in this country without being able to speak English. In the second part of the facsimiles of the National Manuscripts, photographed by Colonel Sir Henry James, there is a letter from Cuthbert Tunstal, Master of the Rolls, who was then in Germany, to Cardinal Wolsey. It is dated October 12th, 1520, and contains the following: "Please it your Grace to understand that here, in these parts, I met with a servant of the King's, called Nicholas Craczer, a German, deviser of the King's horologes (who showed me how the King had licensed him to be absent for a season, and that he was ready to return into England), whom I desired to tarry until I might write to the King's Highness, to know his pleasure whether he would suffer him to be in company with me for a season, until the assembling of the electors were past." In a Book of Payments by the Treasurer of the Household from Candlemas-day, 29 Henry VIII. to Mid-summer, 33 Henry VIII., in the Arundel manuscripts (No. 97), among the discharges of the former year (1538), is the entry "Nicholas Cratzer, Astronomer, received five pounds as his quarter's wages."

Holbein the painter appears to have assisted Cratzer in his work by carving and otherwise decorating sun-dials and cases for time-keepers. Horace Walpole purchased at Mons. Maritte's sale a water meter which had been designed by Holbein as a new year's gift to Henry VIII. On its summit was a clock driven by wheel work, below were fore and afternoon dials showing the time by shadows, and beneath these a clepsydra indicating the quarters of an hour.

In the corridor at Windsor Castle is a clock which **Anne Boleyn's** is said to have been presented to Anne Boleyn on **Clock.** her wedding morning by Henry VIII. It is rather over four inches square and ten inches high, surmounted by a figure of a lion. It was purchased on behalf of Queen Victoria for £110 5s. when Horace Walpole's collection at Strawberry Hill was sold, and was then described as "a clock of silver gilt richly chased, engraved and ornamented with fleur-de-lys, little heads, etc. On the top sits a lion holding the arms of England, which are also on the sides." The weights are of lead cased in copper, gilt and engraved; on one are the initial letters of Henry and Anne and true lovers' knots; on the other H. A. alone, at the top of each is "Dieu et mon droit"; at the bottom "the most happye!" The movement at present in the case has brass wheels, a crown wheel escapement and a short pendulum; though not modern it is certainly later than the middle of the sixteenth century. A sight of the clock evoked from Harrison Ainsworth a reflection to which but few will take exception. "This love token of enduring affection remains the same after three centuries, but four years after it was given the object of Henry's eternal love was sacrificed on the scaffold. The clock still goes! It should have stopped for ever when Anne Boleyn died." And whether by accident or design, though the weights are suspended below the supporting bracket, the mechanism is now silent, the hand moves not. There is no record as to the maker of this interesting relic, of which a drawing is appended, but at this time most of the "orologes" were the production of foreign artists, judging from the names quoted in State Papers of the period.

In the "Privy Purse Expenses of Henry VIII., from 1529 to 1532," edited by Sir Harry Nicolas, it is recorded that in July, 1530, £15 was paid to the Frenchman who sold the king "ij clocks at Oking." In the following month was paid to "a Frenchman called Drulardy, for iij dyalls and a clokk for the King's Grace the sum of £15." In

December of the same year £19 6s. 8d. was "paid to Vincent Keney clok maker for xj clokks and dialls." So many payments within a brief period warrant the assumption that clocks were a form of present favoured by his Majesty.

In the "Sixth Report of the Historical Manuscripts Commission"



FIG. 30.—Anne Boleyn's clock.

mention is made of an agreement, dated 1599, between one Michael Neuwers, a clockmaker, and Gilbert, Earl of Shrewsbury, for the construction of a clock. "It is agreed that Michael should make a striking clock about the bigness of that which he made for the Earl six years past; it is to be made by the last of December next. The

cover or case of it to be of brass, very well gilt, with open breaking through all over, with a small fine hand like an arrow, clenly and strongly made, the . . . or white dial plate to be made of French crown gold, and the figures to show the hour and the rest to be enamelled the fynelyest and daintyest that can be, but no other colour than blew, white, and carnalian; the letters to be somewhat larger than ordinary; the price of the clock must be £15, which makes with the earnest already given £16, but the circle I must pay for, besides the gold which shall make it; the sides of the brass case must not be sharp, but round, and the case very curiously made."

That the same Earl of Shrewsbury was somewhat of a connoisseur of timekeepers, as well as an authority on horological matters, is borne out by the following letter, dated 1611, from him to Sir Michael Hickes, which is preserved in the Lansdowne MSS. at the British Museum:—

"I perceived by you to-day that you understood My Lord Treasurer's design was to have a watch, but I conceaved he wysshed a stryknge clock, made lyke a Watch, to stande oppon a Cubbart, & suche a one (though no new one, & yet under a dozen years ould) I have found oute, & send you by this bearer, which I pray you deliver to his Lordship from me, & tell him that I am very well perswaded of the truth of it, or else I should be ashamed to send him so gross & rude a piece as this is, & if I hadd thought his Lordship could have well forborne it but for four or five days longer, I would have bestowed a new case for it, for this is a very bad one. If his Lordship would not have it stryke, either in the dayes or nights, the striker may be forborne to be wounde up, and so the Watch being wounde up it will go alone. It will goe twenty-six houres, but I wyshe it may be wounde up every mornynge or nyght about eight or nine o'clock, which will be sufficient until the next day or nyght at the same tyme."

Among the State Papers of the time of James I. there is an original letter, dated August 4th, 1609, addressed by Sir Julius Cesar to the clerks of the signet, requesting them to prepare a warrant to pay £300 to Hans Niloe, a Dutchman, for a clock with music and motions. And on the 17th of the same month Sir Julius wrote from the Strand to Salisbury, stating that he was pressed by Hans Niloe for the £300 for his clock.

In "A true certificat of the names of the Straungers residing and dwellinge within the City of London," etc., taken by direction of the Privy Council, by letters dated September 7th, 1618, it is stated that

in the ward of Farringdon Within was then living "Barnaby Martinot, clockmaker; *b.* in Paris; a Roman Catholicque." In Portsoken ward was living "John Goddard, clockmaker; lodger and servant with Isack Sunes in Houndsditch; *b.* at Paris, in Fraunce; heer three years; a papist; yet hee hath the oath of allegiance to the king's supremacy, & doth acknowledg the king for his soveraigne dureing his abode in England; & is of the Romish church."

**Paris
Guild.**

In 1544 the Master clockmakers of Paris were incorporated by statute. The enactment decreed that, "No one, of whatever station, if he be not adnitted a master, shall make, or cause to be made, clocks alarums, watches, large or small, or any other machine for measuring time, within the said town, city, and precinct of Paris, on pain of forfeiture of the said works, and of arbitrary penalty," etc. The Associated Clockmakers appear to have governed the trade till the revolution of 1789, when all the guilds were abolished.

**Clock at
Hampton Court
Palace.**

Derham gives the numbers of the wheels and pinions of a large clock which appears to have been erected at Hampton Court Palace about 1540. This date is assumed from the marks N.O. or N.C. and the figures 1540 which were engraved

on a bar of the original wrought-iron framework. If the letters were N.C., they may have referred to Nicholas Cratzer. In 1711 the clock was repaired by Langley Bradley. The original and curious dial of the clock is on the eastern side of the gate-tower in the second quadrangle. It is composed of three separate copper discs of different sizes, with a common centre, but revolving at varying rates. The smallest of these is 3 ft. 3½ in. in diameter, and in the middle of this is a slightly projected globe, painted to represent the earth. The quarters marked on the centre disc by thick lines are numbered with large figures, and round the edge this disc is divided into twenty-four parts, a red arrow painted on the second disc pointing to these figures and showing at once the quarter in which the moon is, and the time of southing. Next to the figure of the earth in this centre disc, a circular hole, 10 in. in diameter, allows a smaller disc travelling behind to show the phases of the moon. On the second disc, 4 ft. 1½ in. in diameter, but of which only the outer rim is seen, are twenty-nine divisions, and a triangular pointer, projecting from behind the central disc, shows the moon's age in days. The largest of the three discs is 7 ft. 10 in.

in diameter. There are many circles painted on so much of the rim of this as is seen, the inner, or, following the order above observed and proceeding from the centre, the first circle, giving the names of the months, the second the days of the months (only twenty-eight for February), the third the signs of the zodiac, and on the rim, with 30° for each space filled by a sign, a circle divided into 360 parts. A long pointer with a gilded figure of the sun attached, projecting from behind the second disc, shows on this third or outmost disc of the dial the day of the month and the position of the sun in the ecliptic. This pointer performs another duty, acting like the hour hand of an ordinary clock, and showing the time of



FIG. 31.—Dial of Hampton Court Palace clock.

day or night as it passes the twenty-four figures—two sets of twelve—painted on the stonework within which the dial revolves. The diameter of this outer immovable circle on the stone is 9 ft. 8 in., and the characters for the hours are Roman numerals, 9 inches in length.

In 1575 a payment appears to have been made to George Gaver, serjeant painter, for painting the great dial at Hampton Court Palace, containing hours of the day and night, the course of the sun and moon, and doubtless since that time the same necessary restoration has been often undertaken.

In 1835 an extraordinary transposition was made, for the works of the old clock were removed, and have since disappeared. In

their place was fixed a movement with the following inscription: "This clock, originally made for the Queen's Palace in St. James's Palace, and for many years in use there, was, A.D. 1835, by command of his Majesty King William IV., altered and adapted to suit Hampton Court Palace by B. L. Vulliamy, clockmaker to the king"; and on another plate on the clock—"Vulliamy, London, No. 352, A.D. 1799." Worse than all, the precious dial was taken down and stowed away in a workshop at the palace, the gap left being filled by a painted board. In 1879, however, a new and sufficient clock movement was provided, the dial found, restored by Mr. James Thwaites, and replaced. It now shows the hours, the motions of the sun and moon, etc., with certainly as much regularity as formerly, and as well as N.O. or N.C. could have desired. For the appended sketch of the dial I am indebted to Mr. Thwaites.

Curious Clock At the top of the main staircase of the British Museum is a most curious clock, which was
by Isaac Habrecht.

bequeathed to the nation

by Mr. Octavius Morgan. It was constructed in 1589 by Isaac Habrecht, one of the two ingenious brothers who made the second famous clock at Strasburg. It is about four feet in height, and the general design is the same as that of the left tower of the Strasburg clock, and on the sides of both are figures of the three Fates,

Clotho, Lachesis, and Atropos, and each is surmounted by a figure of the cock of St. Peter, which at the stroke of the hour flaps its wings and crows. It had originally a balance as a controller, for

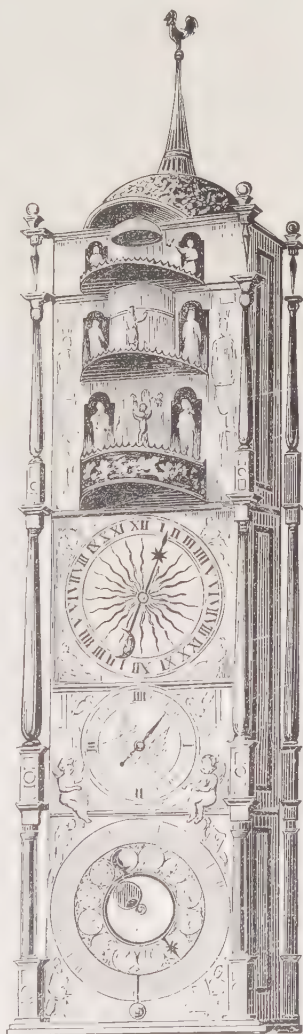


FIG. 32.

which a pendulum was subsequently substituted. The quarters are struck by four figures, representing the ages of man, and the hour by a figure of Death. On a lower balcony is a seated figure of the Virgin and Child, before whom passes a circle of angels, who, as they are set in movement by the striking of the clock, are caused to make an obeisance in front of the Virgin. Below this, the gods of the days of the week perform their circuit, each driving in a chariot, while the dials on the lower stages fulfil the more useful functions of indicating the hour, the phases of the moon, the feasts of the Church, etc. The case is of gilt copper, with well-engraved figures and ornamental designs, perhaps by Tobias Stimmer, who was employed to decorate the original clock at Strasburg. The history of this clever piece of mechanism is somewhat curious, though it rests upon slender foundations. It is stated that Pope Sixtus V. was so pleased with the Strasburg clock that he ordered Habrecht to make one of the same kind. The timekeeper of which a view is given on page 51 was the result, and it remained at the Vatican for two hundred years. Its next appearance was in Holland, where it was in the possession of the king; from Holland it was brought to London and exhibited about 1850.

The cathedral of Lyons contains a remarkable specimen of complicated horological work, which is in the form of a tower forty feet high. The original clock was constructed by a mechanic named Nicholas Lippius, of Basle, who completed it in 1598. Guillaume Nourisson in 1660 repaired the structure, and among other alterations introduced a large oval dial. Not only was the outline of the dial oval, but also the graduated and figured band, which was divided into sixty to represent the minutes, and with distinct marks for the quarter hours. From a description of this curious clock published in 1677, are taken the following engravings, which show how the hand dilated and contracted as it travelled around the dial in order that one tip might always indicate the minute and the other the quarter hour.

Fig. 34 is the exterior of the hand stretched to its maximum length. As the hand approaches the narrower part of the oval, the inner socket-like ends of *a* and *b* pass over the extremities of the fixed central portion.

Fig. 35 is a view of the central part with the ornamental covering removed.

Fixed to the centre part is a cannon pinion driven by a bevelled pinion which also drives another pinion, the stalk of which passes through the cannon to the upper part of the hand, and there



FIG. 33.—Lyons clock.

engages with a double crank attached by means of connecting rods with the solid core of the parts *a* and *b*.

This dial is on one side of the tower. On the front are two dial

plates as shown in the engraving on page 53. The lower one is a calendar, and the other an astrolabe. The calendar is divided into 365 divisions, on which are fixed crowns. Each crown represents the day of the month in the calendar, and the name of the saint, when the anniversary of the latter is due. The names of the months are on the circumference. The circle forming the centre is divided into sixty-six years, and moves one division forward on

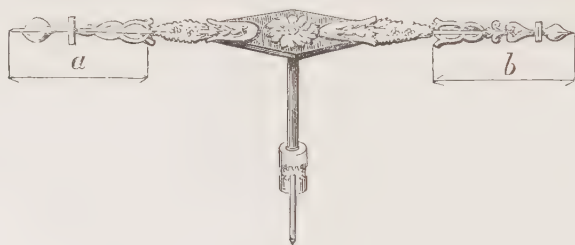


FIG. 34.

the 31st of every December. The inscriptions about the religious festivals, etc., are in handwriting on parchment. The astrolabe is exceedingly ingenious. Thereon all the zodiacal and other astronomical signs are displayed, the solar and lunar movements, etc. In the upper part of the tower are various automatic pieces. There

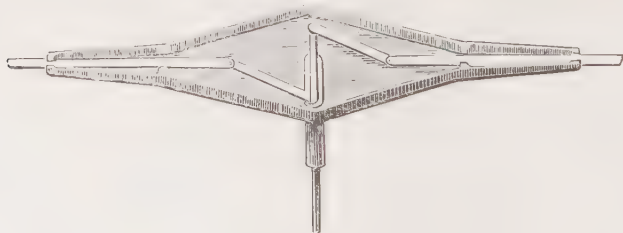


FIG. 35.

is a gilt *niche* in which appear representations of the days of the week. For Sunday the symbol is the Resurrection; Monday, Death; Tuesday and Wednesday, Saints Stephen and John; Thursday, the Sacrament; Friday, the Passion; Saturday, the Virgin. At midnight, the statue that has finished duty cedes the place for that of the coming day. On the left is an angel which turns a sandglass every hour; on the right, another angel beats the measure with head, hand, and foot, as the clock strikes each hour.

Above all is a large space, where the Almighty in the scene of the Annunciation bestows His benediction. The cupola terminates the monument and covers the bells, which play several religious chants and the *Ave Maria*. There is the figure of a beadle who appears, and marches round the gallery, to inspect, as it were, the bells.

In 1895, Chateau, of Paris, thoroughly repaired the clock, by direction of the French Government.

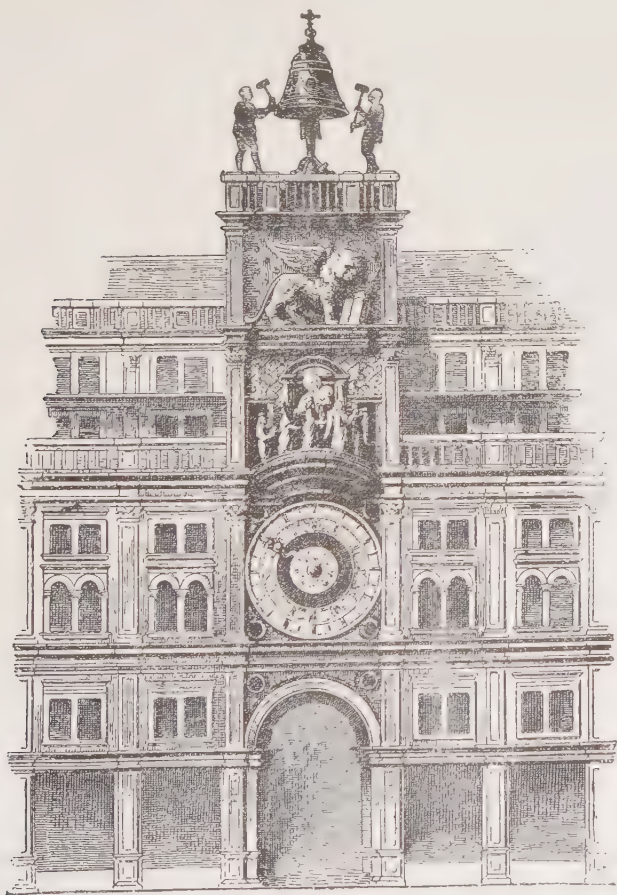


FIG. 36.—Venice clock.

Venice Clock. The first clock in the Square of St. Mark, at Venice, the work of Giovanni P. Rainaldi, of Reggia, and his son Carl, was completed in 1495. Of its construction but little is known. Its successor, the monumental time-

keeper shown on p. 55, was erected at the Grand Piazza early in the seventeenth century. There is a large dial showing the hours, and above is a balcony of gilt lattice surrounding an image of the Blessed Virgin, seated between two doors overlaid with gold. Evelyn, in his "Memoirs," under date 1645, speaks of this "admirable clock, celebrated next to that of Strasburgh, for its many movements; amongst which abound twelve and six—which are their houres of Ave Maria, when all the towne are on their knees—come forth the 3 kings led by a starr, and passing by ye image of Christ in his Mother's armes do their reverence, and enter into ye clock by another doore." Another writer in 1841 remarked that at a certain period of every year, on the Feast of the Ascension, and fourteen days afterwards, as the hour struck, the door on the right hand opened and an angel with a trumpet issued forth, followed by three Eastern kings, each of whom, as he passed the Virgin, raised his crown, bowed, and then disappeared through the other door. The hours are struck by two bronze giants on a large bell which surmounts the structure.

PORTABLE TIMEKEEPERS.

It was not until driving weights depending from cords or chains were superseded by a more compact motor, which allowed of their being readily transported from place to place, that timekeepers were regarded as objects of particular interest, the acquisition of which was sought in fashionable circles.

Daines Barrington, in vol. v. of the *Archæological Journal*, speaks of a watch as belonging to Robert Bruce, who died in 1329. This watch was of small size, with an enamelled case, a piece of transparent horn over the dial, and had engraved on the plate "Robertus Bruce," in Roman characters. Though it passed current for some time at the end of last century, and eventually became the property of George III., careful examination revealed the fact that the inscription was undoubtedly a recent addition, and the watch a production of nearly three centuries later than Bruce. Except that the quotation of Barrington's statement is perennial it would be hardly worth while to refer to so clumsy an imposition.

It is now generally conceded that the production of a portable timekeeper was accomplished by Peter Henlein or Hele, a clock-

maker of Nuremberg, who was born in 1480 and died in 1542. He, shortly after 1500, used a long ribbon of steel tightly coiled round a central spindle to maintain the motion of the mechanism. The invention has been ascribed to Habrecht and others, at a much later date, but Johannes Cöcleus, who was born in 1470, in his commentary dated 1511, accurately describes a striking watch and distinctly credits its introduction to Henlein. Although portable timekeepers were not in general use for a long period afterwards, a taste for table clocks and watches was at once apparent among wealthy people, who delighted in the possession of curious novelties.

The earliest watches are scarcely to be distinguished from small table-clocks. The case was a cylindrical box, generally of metal, chased and gilt, with a hinged lid on one side to enclose the dial, the lid being engraved and usually pierced with an aperture over each hour, through which the position of the hand might be seen. Most of the watches were provided with a bell, on which in some cases the hours were sounded in regular progression; in other instances the bell was merely utilized for an alarm. The cases were usually worked *à jour* to emit the sound.

At the South Kensington Museum is a circular table clock, about three inches in diameter, in an engraved brass case having a perforated dome surmounted by a small horizontal dial as shown in Fig. 64. On the inside of the bottom cover is inscribed, "P. H. Nor . . 1505." Mr. Mitchell, of the South Kensington Museum, suggests that "Nor" stands for Norimbergue, "at Nuremberg," and accepting this explanation one may reasonably conjecture that the original parts of this clock are the handiwork of Hele. The plates of the movement are of steel, but the balance and its accessories are comparatively modern.

On very early productions the maker's name is exceptional; initials are a more usual signature, and occasionally a work stamp is to be found, from which it may be possible to ascertain the locality of manufacture. Most German towns had a distinctive trade or work mark, that for Nuremberg being the letter N in a circle, and for Augsburg a pineapple.

There are several specimens in the British Museum of a date between 1535 and 1570. Of two by Jeremia Metzger (or Metzker), Augsburg, one is furnished with a bow and one is without any provision for suspending the watch.

The South Kensington collection includes a circular striking and alarm clock, supported by a figure of Atlas on a pedestal of gilt

brass inscribed thus : "Jeremias . Metzger . Vrmacher . 15. 60 . in Avgspvrg."

A clock with complicated movements by this maker in the Vienna Treasury is dated 1564. In the same repository are two watches in cylindrical brass cases which match each other. The movements



FIG. 37.

bear the letters A.S. arranged as a monogram, but there is no other indication of the maker.

Fig. 37, from the Soltykoff collection, is one of the earliest of the kind. It is unnamed, but doubtless of German make, in a brass gilt case with covers top and bottom. In the open top cover may be seen the twenty-four perforations, through which the position of the

hand could be discerned. For this engraving and other illustrations of sixteenth century horology, formerly in the magnificent collection of Prince Pierre Soltykoff, I am indebted to the sumptuous descriptive quarto prepared by Pierre Dubois.

Of another early example belonging to Mr. Schloss three views are appended (Figs. 38, 39, 40). The movement is especially interesting. It is of the most primitive character, the balance for



FIG. 38 (AS)

controlling the motion of the wheels being of the crossbar type, designated by Froissard "*le foliot*." Another feature, the "stack-freed," for equalizing the power, will be referred to a little further on.

A large oval case, with geometrical perforations in the lid, was almost contemporaneous with the circular-box form, and an oval shape, either small and plain or larger with more or less of decoration, remained in favour for over a century. The oval striking and alarum watch reproduced in Fig. 41 is sixteenth century work by

Jacques Duduict, "*maitre orologier en la bonne ville de Blois*," and is from the Soltyski collection. It has covers back and front, on each of which is a tableau reproducing a scene in the life of Esther.



FIG. 39 (A5).

The luxury and extravagance in dress which characterized the Elizabethan period required more variety of form and colour than could be found in a plain regular form of gold or silver, so rock crystal and other stones were often converted into cases, which

were cut in the form of crosses, stars, shells, and other extraordinary fancies, while the dials and mounts were occasionally enriched with

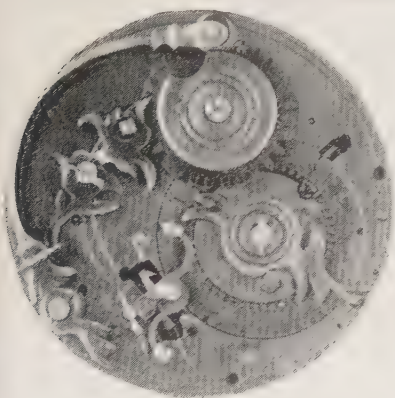


FIG. 40 (A S).



FIG. 41.



FIG. 42.

coloured enamels. The most elegant of these costly toys emanated from France, Blois being distinguished as an early seat of manufacture.

Figs. 43 and 44 represent what Dubois declared to be one of the richest productions of the kind which has survived. It is from the Soltykoff collection, oval in form, with square edges, in a case of crystal, with mountings engraved, splendidly enamelled, and further embellished with diamonds and rubies. The ball depending from the bottom of the case is a fine pearl. The dial is of gold, the borders above and below being enriched with enamel of various



FIG. 43.

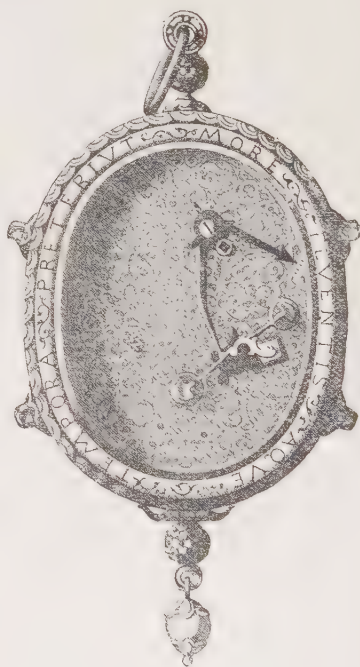


FIG. 44.

colours. The back plate is engraved all over with arabesques, giving a delightful effect. In the midst of the engraving may be discerned the letter N, the Nuremberg work mark. It bears no indication of the maker's name, but from the primitive *foliot* balance and other features it may safely be classed as not later than mid-sixteenth century work.

There is at the Horological Institute a print of a very old striking or clock-watch, the case of which is enriched with remarkably fine

arabesque work, pierced to emit the sound. Front and back views of this watch are appended. The dial has two hour circles, the divisions of the outer circle being marked with Roman, and those of the inner with Egyptian characters, while between the two is a circle of minute marks. This curious piece of mechanism, which came from Germany, weighs thirteen ounces, ten pennyweights troy. Lately I have had an opportunity of examining the watch, which belongs to Mr. Schloss. It is one inch and three-quarters in thickness, and three inches in diameter; the wheels are of iron, but it has neither barrel nor fusee. There are two springs, one the motive power for timekeeping, and the other for striking, which is



FIG. 45.—German clock-watch.



FIG. 46 (A S).

effected upon a broad bell occupying the whole bottom of the watch. The outer end of the mainspring appears to be attached to a pillar between the plates—an arrangement reintroduced in quite modern times for cheap clocks.

There has been lately added to the British Museum a table watch in a drum-shaped case, dating from about 1550. It is from the Zschille collection, and is shown in Fig. 47. The mechanism is very crude, without screws, and includes a *foliot* balance and stackfreed. The movement bears, in a shield, the work mark M and a *fleur-de-lis*.

A fine striking watch in a circular table case, from the Soltykoff collection, is shown in Fig. 48. It dates from about 1575 and is by

Charles Cusin, "*maitre horloger de la ville d'Autun.*" The hour band is of silver and the hand of blue steel. It has covers top and bottom, the upper one pierced as shown; the solid centre is the reverse of a mounted cavalier, of which the obverse is visible when the cover is closed; this it is averred represents Henri IV., King of France and of Navarre. The under cover, similarly pierced, contains in the centre a mounted figure, said to be a counterfeit of the son of Marie de Médicis, afterwards King of France.

The origin of the term "watch" is not very clear. It may have been taken from the Swedish *vacht*, or from the Saxon *wæcca*, "to wake"; but whatever its derivation, it had not, when introduced, the signification we now attach to it, because timekeepers were not



FIG. 47.

then worn in the pocket. But "watch," or "clock," or "orologe," seems to have been used indifferently as a title for timekeepers, and so it is often difficult to decide whether a weight clock of large size or a very minute spring timepiece is meant. Derham, in all the editions of his book, speaks of timekeepers driven by weights as watches, reserving the word clock for parts connected with the striking.

The action of the mainspring, which still retains its place as a motor for portable timekeepers, will be understood with the aid of the subjoined figure. Here, as is usually the case, the spring is contained in a circular box or barrel *c*, its inner edge being hooked on to the enlarged part of the arbor *a*, and its outer end attached to the inside of the rim of the barrel. The arbor passes through

and fits easily a hole in the bottom of the barrel, and a hole in the barrel cover *e*. The spring is wound by turning the arbor, and then if the spring barrel is attached to the largest wheel of the clock, in place of the cylinder or drum from which the weight was suspended, the spring in its effort to unwind turns the barrel, and with it the wheels composing the clock train. Of course some



FIG. 48.

provision must be made to prevent the spring from at once uncoiling when the arbour is released after winding, and the simplest plan is to have a ratchet wheel fixed on one end of the arbor, with which a click pivoted to the framing of the timekeeper engages. When the barrel is used in conjunction with a fusee, as will be described presently, the spring is wound by turning the barrel instead of the arbor.

But it is evident that just as the spring offered increased resist-

ance to every successive turn of the arbor in winding, so the force transmitted by it when fully wound would be very much greater than the force exerted after the barrel had made a few turns and the spring had partially run down, and this variation of force was the cause of considerable perplexity for some time after the invention of the mainspring, for with the verge escapement variation of force means variation of timekeeping. The first contrivance applied with a view of overcoming or abating the drawback was, I believe, that known as the "stackfreed." I have tried in vain to trace the derivation of this curious word, but am told it is of Persian origin. The device did not prove to be an enduring one, and is very rarely to be met with. It may be seen on Fig. 40, and two other representations of it are appended, one from a very early *foliot* watch in a tambourine case from the Soltykoff collection, and the other from a watch of a slightly later period. The action of the "stackfreed" may be gathered from the following description:—

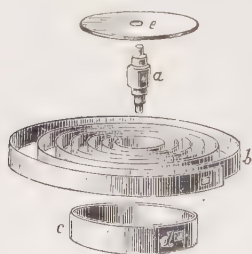


FIG. 49.—Mainspring and barrel.

Fixed to the mainspring arbor above the top plate is a pinion having eight leaves. This gears with a wheel having twenty-four teeth, which do not quite fill out the circumference of the wheel, but leave a block of two spaces in width which acts as a stop to the pinion when the mainspring is wound, and after it has run down three whole turns.

Fastened to the wheel is a cam, concentric for about seven-eighths of its circumference and intended for the remainder, as shown in the drawings. There is a groove in the concentric portion of the edge, into which is pressed a roller which is pivoted at the free end of a strong curved spring. When the mainspring is fully wound the roller rests in the curved depression of the cam, and the effort required to lift the roller up the incline till it is placed upon the concentric contour absorbs so much of the force of the mainspring as to prevent banking. When the mainspring has nearly run down, the roller, in entering the depression by pressing the cam in the direction that it is moving, really aids the mainspring in its effort.

In Fig. 51 is a point worthy of note. As a form of regulator are two banking pins of stiff bristle, which the straight arm of the balance knocks against. These are mounted on a lever which is pivoted at one end by means of a screw near the edge of the plate.

The pins may be caused to approach or recede from the centre of the balance by moving the free end of the lever, and in this way the vibrations of the balance would be retarded or quickened. An

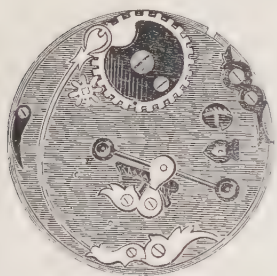


FIG. 50.



FIG. 51.

Watch movements with "stackfreed."

engraved scale on the plate registers the movement of the free end of the lever.



FIG. 52.

Fig. 52 is an exterior view of this watch, which has a brass case and silver dial. It is most likely of German make, dating from about 1620.

It is not a matter for surprise that a frictional brake like the stackfreed, which must have absorbed an appreciable proportion of the force, failed to give satisfaction for equalizing the pull of the mainspring. The fusee invented for the same purpose by, it is said, Jacob Zech, of Prague, about 1525, is of a far different nature, and still survives. It consists of a spirally grooved pulley, which is interposed between the mainspring barrel and the great or driving wheel of a clock or watch, the connection between the barrel and the fusee being made by a cord or chain, one end of which is attached to the barrel and the other to the fusee. When the spring is relaxed there must be at least as many coils of the cord around the outside of the barrel as the barrel is to make turns in winding the spring. To wind the spring, the fusee is rotated by means of a key

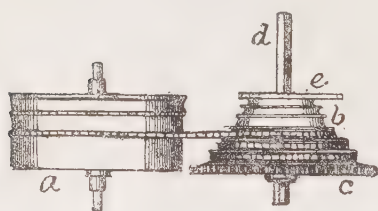


FIG. 53.—Mainspring barrel and fusee.

a, mainspring barrel; *b*, fusee; *c*, great wheel;
d, winding square; *e*, snail-shaped flange.

fitting a square formed at one end of its arbor, whereby the cord is drawn from the barrel on to the fusee, the first coil being on the larger end of the fusee, as shown in the accompanying sketch (Fig. 53).

Then, as the mainspring runs down, the barrel rotates and coils the cord on to its periphery again. But while the mainspring when fully wound turns the fusee by uncoiling the cord from the smallest part of the fusee, it gets the advantage of a larger radius as its energy becomes lessened, and by proportioning the diameter of the fusee to the varying pull of each successive turn of the mainspring an excellent adjustment is obtained, so that the pressure exerted by the great wheel on the centre pinion is constant. The fusee is fixed to its arbor, on which, in the simplest arrangement, the great wheel rides easily, the connection between the fusee and great wheel being made by means of a ratchet wheel and click; this allows of the fusee being rotated to wind the mainspring. To prevent undue strain on the cord when the winding is completed, the cord as it is being coiled on to the smallest turn of the fusee, pushes an arm which is pivoted to the framing of the timekeeper in the path of a snail-shaped flange of the fusee, and this forms a stop. The barrel arbor is always stationary. In the early fusees the cord was of catgut, and this material is still sometimes used for

clocks. Chains were introduced in place of catgut for watches in 1664, by one Gruet, a Swiss, and they are still used for marine chronometers, for some clocks, and for the few fusee watches that are made.

Table clocks or watches of the sixteenth century are exceedingly rare. Many specimens put forward as such are found on examination to be of a later date. There is no doubt that the manufacture of portable timepieces extended to Holland and France before the end of the century, but very few examples of that period survive. A genuine specimen would have no covering glass over the dial, and, if a fusee were present, the connection between it and the barrel would be by a piece of catgut, and not a chain. There would be, of course, no controlling spring to the balance at that period, while the balance cock, instead of being spread over the whole extent of the balance, would be narrow. The workmanship of the movement would be comparatively rough, however lavishly the case might be ornamented.

During the first quarter of the century the frames and wheels were of iron or steel; productions of the second quarter having brass plates and pillars are occasionally to be met with. But brass wheels before the middle of the century were quite exceptional. Screws seem to have been introduced to join pieces of metal in German timekeepers about 1550, so that in early sixteenth-century timekeepers these convenient fasteners would be absent, and the various junctions made by riveting or the use of either pins or cotters. Screws are not met with in English work till quite late in the century, and are absent in some early seventeenth-century watches. There were rarely any winding holes in the cases of sixteenth-century watches, to attach the key to the winding squares the case had to be opened and usually the movement to be turned out of the case, a cover at the back being the alternative.

The Society of Antiquaries possess an undoubted example of the handiwork of Jacob Zech, the inventor of the fusee. It is a table timepiece with a circular brass gilt case 9 $\frac{1}{4}$ in. in diameter, and 5 in. in height, which was bequeathed to the society by Mr. Henry Peckitt, an apothecary, of Compton Street, Soho, and handed over by his executrix in 1808. It was given to James Ferguson, the astronomer and mechanic, by Mudge, and at the sale of Ferguson's effects it was bought by Mr. Peckitt in 1777. Captain W. H. Smyth gives a minute description of this relic in *Archæologia*, vol. xxxiii.

From the decoration of the case and dial, it is inferred that the clock was made for Sigismund I., King of Poland, and that he presented it to Bona Sforza, to whom he was married in 1518. There are three shields equidistant round the case, which is altogether nicely decorated. On one shield is an eagle displayed and crowned, representing Poland; the second contains a serpent entwined and wavy pale crowned, a child issuant from its mouth and surmounted by a ducal crown—this is typical of the house of



FIG. 54.

Visconti; the third shield bears the arms of Lithuania, a knight armed *cap-à-pie*, and mounted on a horse proper, holding in his dexter hand a drawn sword, and having pendant from his neck a shield charged with the Hungarian cross. The frame is fastened by buttons on dogs. The verge pivots act on iron dovetails. The regulator is a cross-bar balance of the kind used in De Vick's clock, except that instead of loose weights of iron there are leaden weights screwed one on each end of the cross-bar, and the adjustment is made by screwing to or from the centre of motion. Originally these were doubtless fixed weights riveted on and without any

provision for adjustment. There are two yielding brass arms to act as a banking and check excessive vibration of the cross-bar. There are eight turns to the fusee, which is of soft metal, and in a circle on



FIG. 55.

the face of the barrel is engraved in Bohemian, an inscription which Smyth translates thus : " When we counted 1525 years, then made me Jacob Zech (or rather Jacob the Bohemian) at Prague ; it is true."

There was originally some additional wheelwork to show the motion of the sun and moon on an engraved ecliptic, and also a contrivance to strike one at every hour. The wheels are of iron and show punch marks of division, proving that they had been cut with a file by hand. A catgut had been used to connect the barrel



FIG. 50.

with the fusee, but a metallic chain was subsequently applied, which destroyed several of the threads. Before this was done it went for forty-eight hours with one winding, and gave about 3600 beats in the hour.

In the British Museum is an excellent specimen of a German

early table clock of a square oblong shape. The works are of iron. It has no fusee. It fits into an engraved metal box, having a hinged cover. The date of production is stated to be 1530.

Among the collection of Prince Soltykoff was the square table clock shown in Fig. 54. The sides are of bronze gilt, very finely engraved with allegorical subjects. Representations of St. Paul, Matthew, Mark, and Luke are engraved on silver medallions which occupy the centres. Inside the perforated dome is a bell, and surmounting it a horizontal dial enriched with coloured enamels. It was the work of Louis David, and dates from the middle of the sixteenth century.

Nuremberg and Augsburg pursued the manufacture of portable timekeepers with considerable spirit. The plain square brass towers, round and octagonal boxes, gave place to cases of a much more ornate design when expense was no object. A very choice example from Dubois' historical work is shown in Fig. 55; it is of iron, damascened with precious metals, a style of work for which Augsburg was particularly famous.

In the South Kensington Museum is an Augsburg astronomical striking table clock, in an engraved brass and damascened iron case. On the bottom is a sun-dial and the inscription:—

Jacob . Marqvart . von . Avgspvrg . bin . ih . genant .
mein . Nam . ist . in . VVelslandt . gar . vvol . bekant .
der . hat . das . VVerck . gemacht . firvvar .
im . 1567 . Jar .
ain . svnnenvr . ist . das . genant .
avf . Wels . vnd . Deisch . Landt . erkant .

(Jacob Marquart of Augsburg am I called,
My name is quite well-known in Italy,
Who has indeed done the work
In the year 1567;
A sundial is this called,
Understood in Italy and Germany.)

The hexagonal clock in the form of a temple from the collection of Prince Soltykoff and shown in Fig. 56, is also a mid-sixteenth century production. The movement is arranged in stories, the watch part being at the bottom and the striking work above. The six doors or panels between the fluted columns are of steel damascened with arabesques of elegant design. In the arched centre of one of the panels is the dial with a band of blue steel for indicating the hours of the day; various planetary and astronomical motions were shown on the horizontal dial at the top of the structure. The upper part of the case in the style of Henri II is very handsome;

the entablature is supported at the angles by six caryatides, and in the centre of each panel is a medallion with the head of a Roman Emperor or warrior sculptured in high relief and surrounded by a gilt border. A clock similar to the engraving, but surmounted by a statuette, is in the British Museum.

**Curious
Octagonal
Table Clock.** Some time ago, by favour of Mr. Charles Shapland, High Holborn, I had through my hands a curious sixteenth-century striking clock of octagonal form, of which a view is subjoined.

This clock, which is now in the British Museum, is probably of Nuremberg or Augsburg manufacture, and has a peculiar method of indicating the rising and setting of the sun daily throughout the year, by means of two thin metal dials within the hour circle. One of these dials is of silver and the other of steel for contrast; each of them forms a segment nineteen twenty-fourths of a circle, divided by radial lines into nineteen parts, which are numbered at the circumference from one onward in Arabic figures, so that each division is one twenty-fourth of the whole circle. A brass disc, divided into twenty-four, is fixed to the steel dial by rivets at No. 1 and 3; No. 24, or zero point of the circle, coinciding with what may be called the initial edge of the steel dial. The steel and silver dials are interlaced—that is to say, the concealed portion of the steel dial is underneath the silver one, while the initial edge is above it. At the shortest day in the year the least portion of the silver dial would be visible, and the figure on the silver dial next to the initial edge of the steel dial would represent the number of hours the sun was above the horizon, while the figure on the central brass circle, which happened to be coincident with the initial edge of the silver dial, would represent the number of hours he was below the horizon, and the sub divisions of the hour could be well estimated to within a tenth.

The dials are continually revolving in opposite directions, so that as the days lengthened, more of the silver and less of the steel dial would be seen. At the close of the longest day the motion of the dials would be reversed, and the visible surface of the silver dial would be diminished each day in the same ratio that it was formerly increased, till the shortest day recurred.

It is probable that these dials were arranged to show the beginning of the Hebrew day at sunset, as well as its duration and close at the succeeding sunset.

On removing the dial plate, the way in which the dials are actuated is apparent. Fitting loosely on the centre wheel which carries the hour hand is a pinion of twenty-four leaves. The pipe of this has a cruciform top fitting into the centre of the silver dial. On the pipe of this pinion is another, larger in diameter, but also of twenty-four leaves, and with a similar top to carry the steel dial. A double rack or segment of a wheel, having internal and external teeth, is pivoted close to the edge of the movement, and engages with both of the dial plate pinions, the internal teeth being farthest from the centre of motion, and of such a distance that they reach beyond the centre arbor and engage with the teeth of the larger



FIG. 57.—Curious table clock, early sixteenth century.

pinion on the other side of it ; the external teeth are so placed that they engage with the teeth of the smaller pinion, but on the side of the centre arbor nearest to the centre of motion of the rack. There is on the plate of the movement, midway between its centre and its edge and driven from the fusee, a wheel which turns once a year. This carries a crank, from which is a connecting rod catching hold of the double rack : so that, as the crank revolves, it gives a to-and-fro motion to the rack. To meet the varying length of the years from leap year to leap year, there are four pins by which the position of the crank could be altered, but, so far as one could see, there is no provision for automatic regulation, so that, if the

reading of the scale is to be exact, the dial would have to be removed and the position of the crank altered once a year.

Recessed into the under side of the clock case is an annual dial engraved with the signs of the zodiac, the titles of the months, and the days. The index for this is fixed to the arbor of the annual

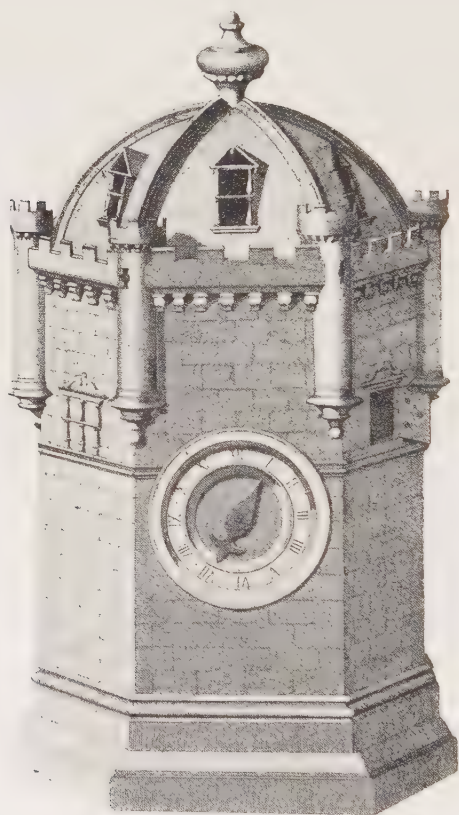


FIG. 58.

wheel already mentioned, and the annual dial is therefore less than half the diameter of the movement.

The case is of brass, engraved and gilt. The hour band is of silver, divided into two periods of twelve hours each, and marked with Roman numerals. Within the hour ring, and separating it from the sun rising and setting discs, is a brass gilt ring engraved with a cable pattern.

All the dial work, the striking train and the going train wheels, up to the fusee, are of iron or steel ; the connection between the fusee and barrel is by a catgut, and the balance is very light, of the

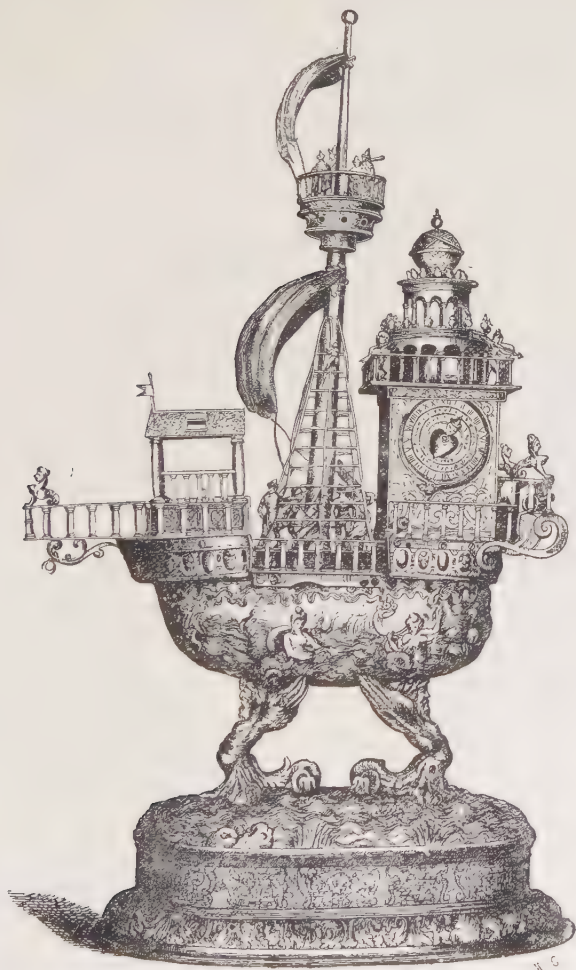


FIG. 59.

Dictionnaire de l'Ameublement.

old cross-bar pattern, but with weights riveted on with no provision for after-adjustment. There is, of course, no balance spring. The hours are struck on a cap-shaped or cylindrical bell.

In the construction of this timekeeper there is not a single screw

used. All fastenings are either pins or wedge-shaped keys or rivets.

The quaint example engraved in Fig. 58 is from the Soltykoff collection. The case appears to be a reproduction in miniature of a mediæval hexagonal fortress. It is a striking clock, probably German, dating from about 1560.

"Nef," or Ship Clocks, were a peculiar fancy of the sixteenth

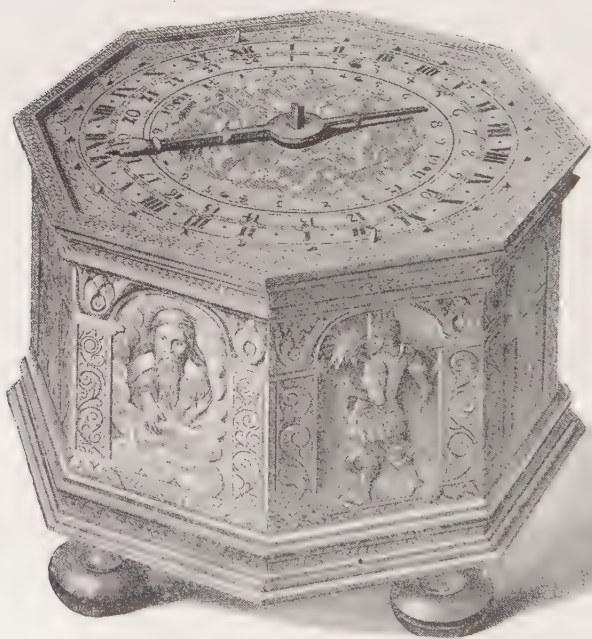


FIG. 60

century. There is one in the British Museum, by Hanns Schlott, dating from about 1580, which is supposed to have belonged to Rudolf II., and another in the Vienna Treasury. The clock mechanism included provision for showing various astronomical movements, and was quite subsidiary to the ship and its appurtenances, as will be gathered from the excellent example given in Fig. 59.

In Fig. 60 is shown a German octagonal clock from the Soltykoff collection.

**Early Clock
with Minute
Hand.**

At the South Kensington Museum is a clock, in an elegant case of metal gilt, in the form of a temple, as shown in Fig. 61. Its height is $13\frac{1}{2}$ in. and its width 8 in. It is most elaborately chased and engraved with figures and arabesques. The pierced dome covers two bells, and is surmounted by a figure standing on a globe. The base is chased with masks and cartouche ornaments,

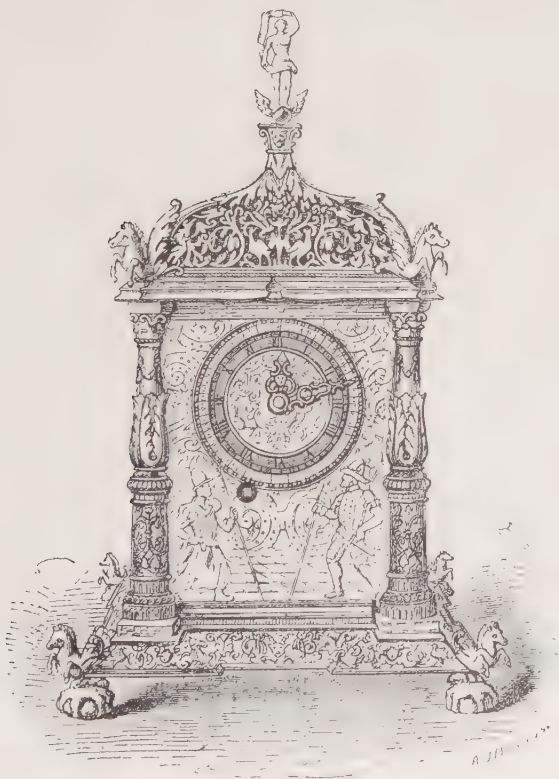


FIG. 61.

with winged horses at the angles, and a dial on each of the four sides showing, besides the hours and minutes, motions of various heavenly bodies. This choice and interesting timekeeper, which formed part of the Bernal Collection, was produced at Munich, and is dated 1587. Every minute is figured from 1 to 60, as was the custom on early timekeepers with minute hands. Though the presence of the concentric minute hand on sixteenth-century work is exceptional, there

is nothing to lead one to suppose that it is in this case an addition to the original construction : and providing the minute hand would certainly present no difficulty to the mind capable of devising the



FIG. 62.

intricate mechanism for the astronomical motions as is contained in this clock.

I recently saw another clock of very similar character which was inscribed, "ASMUS BIRLN B RYNLR IN AVGVSTA VINDLICORUM 1577," and the letters A.B. formed into a monogram.

A somewhat similar portable clock (Fig. 62) from the Soltykoff collection is about 15 inches high and 10 inches across the base, which is supported by four heraldic lions. There are five dials, two on the front face and one on each of the others, and marked the hours of the day, the day of the month, the phases of the moon, the signs of the zodiac, and the course of certain planets.

This clock bears no maker's name, but a very similar one, also in the Soltykoff collection, was inscribed "Andreas Muller, Tristen." It is probably mid-sixteenth century work.

The next example, from the South Kensington Museum, is an elegant form of medallion clock in a rock-crystal case, on a stem, as shown in Fig. 63. The plinth is of metal gilt, with crystal plaques, and contains the striking train. The remainder of the movement is in the upper case. The longer of the two hands, which at the first glance seems to be a minute hand, really points to the day of the month marked on a ring outside the hour ring. The age of the moon is shown by a revolving gilt plate behind the dial, which is cut away to make the moon plate visible. The total height is $7\frac{3}{4}$ inches. It is signed "J. Wolf, Wienn," and dated 1609, but the name "T. Wolf" appears on examination to be a recent addition. It was formerly in the Bernal Collection.

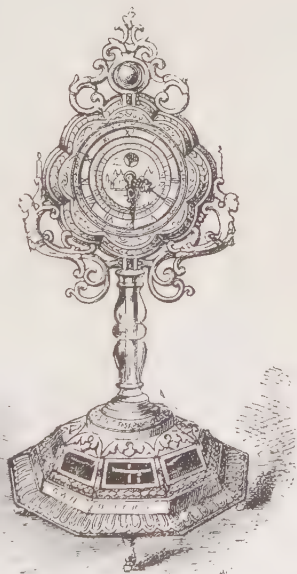


FIG. 63.

The table clock represented in Fig. 64 resembles one at South Kensington Museum which, as mentioned on page 57, was probably made by Peter Hele, except that in the present example the body of the case is square. It is of brass gilt, with bold mouldings as shown, and very nicely engraved; rising from this is a hemispherical dome pierced to emit the sound of the bell which it covers, and supporting above it a horizontal dial. The arrangement of placing the bell between the movement and the dial allows a handsome and appropriate design with which no fault can be found,

except, perhaps, that in order to keep the dial from overshadowing the dome it is necessarily rather small. On the exterior of the bottom of the case is engraved the word VALLEN. The Roman numerals I. to XII. are engraved on a silver band, and within are smaller Arabic figures, 13 to 24.

The chief plate of the movement is square and pinned to the upper part of the square box ; running vertically inside the box are two feathers, these pass through notches in the lower plate of the

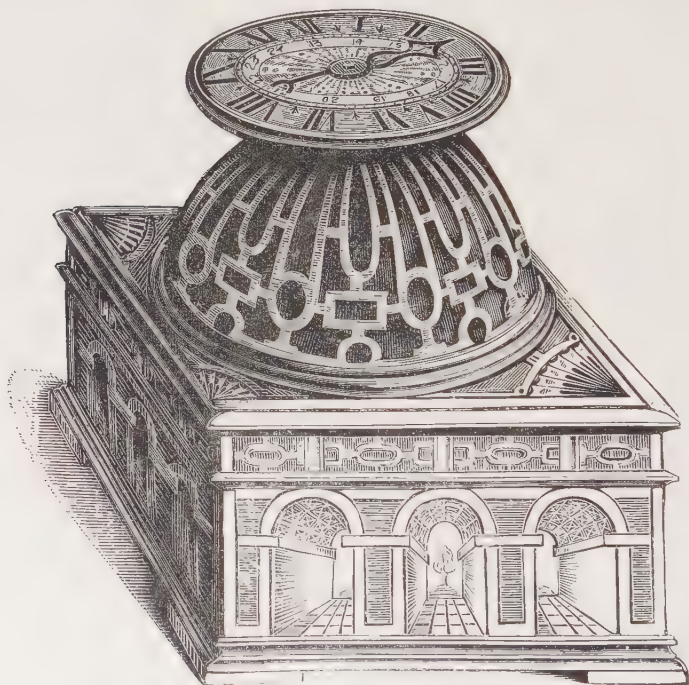


FIG. 64 (A S).

movement ; two turn-buckles on the lower plate butt against the ends of the feathers and so secure the box after it is placed over the movement. The hand is driven from a pinion on the great wheel by means of an arbor which passes through the post to which the bell is secured. It is probably a late sixteenth-century French production.

A good example of early seventeenth-century table clocks is shown on p. 83. It is in a brass case, with silver hour ring divided into twelve and a *fleur-de-lis* midway between each hour. The characteristic features which note the departure from the earliest specimens

are the glass panels in the sides of the case and the bronze feet, which give a better effect than is obtained with the primitive flat hexagonal and octagonal clocks, besides allowing space for the bell to project below the bottom surface of the case.

The cocks and hammer are very nicely engraved and pierced, and on the plate is the name Johan Scheirer. A balance spring has been applied subsequently to the manufacture of the piece, and as the original balance cock is retained, the spring is much cramped. The balance appears to be the original one and is weighted with pieces of metal to keep the vibration sufficiently slow after the

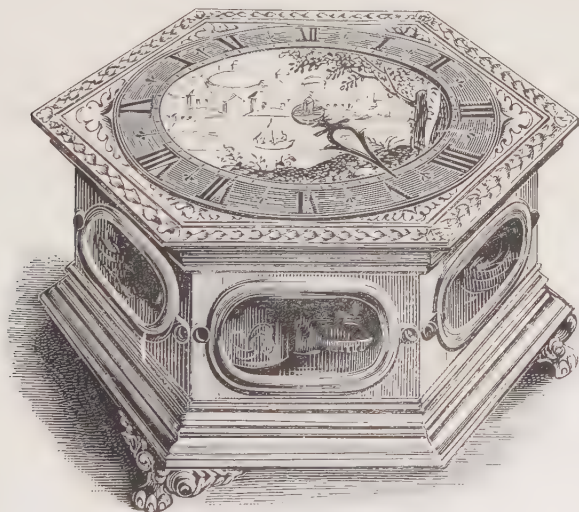


FIG. 65 (A S).

addition of the spring. A notable peculiarity is that the fly pinion has but four leaves.

The handsome striking and alarm clock shown in Fig. 66 is from the Soltykoff collection. It bears no indication of its origin, but the monogram G. O. engraved on it leads to the conjecture that it belonged to Gaston of Orleans, son of Henri IV.

Early Clock with

Balance Spring.

The interesting clock shown in Fig. 67 I saw recently at Messrs. Thwaites and Reed's in Bowling Green Lane.

In the centre of the dial is a plate with the moon's age marked on it and carrying the hour hand ; concentric with this a disc with a round hole showing the

phases of the moon and age. In front, and also concentric with these, is an alarm dial with hands. This turns once in 24 hours. The wheel carrying the hour hand and moon's age has 60 teeth.



FIG. 69.

The one carrying the disc showing the phases and age of the moon, 60 teeth; and the wheel carrying the alarm dial 60 teeth. The two wheels showing the moon's age and hours are driven by a pinion of

20, and the alarm wheel by a pinion of 10, both fixed on same arbor, which makes one revolution in four hours.



FIG. 67.—Clock with early balance spring.

The clock strikes one blow at the first quarter, two at the second, three at the third, and four at the hour, besides the ordinary hours from 1 to 12 ; and then repeats the hours at any interval the clock

is set for: that is, one, two, three, or more minutes after the ordinary hours are struck. This part strikes the hours up to 24, and while striking the figure on the top of the clock revolves. There is a separate train for each part, and the chain on the fusee of the going part has the appearance of having been made at the same time as the clock. The other springs are in brass

barrels screwed to the frame.

The small dial indicates quarter-hours only, and the hand makes a revolution in one hour. There are two hands on this, the under one is to set the interval between the ordinary striking and the 24-hour striking.

The escapement is of course a verge. It has a plain circular balance rather large in diameter. Over the balance is a straight spring, one end of which is fixed to the plate, the free end being embraced by two pins standing up from the rim of the balance, and so acting as a controller.

On the bottom of the clock is engraved



FIG. 68.—French table clock.

the following inscription:—

A.D.

1634.

ADAM KLYZOVICZ

KIAKOVIE FECIT POLONYS.

A splendid specimen of French table clocks in Henri VI. style from Dubois' historical work, is shown in Fig. 68, in which the movement is visible through panels of glass or crystal, most probably the latter.

Fig. 69 is a fair example of the more costly German cabinet or library clocks of the seventeenth century.

During the latter part of the sixteenth and the first half of the seventeenth century, timepieces with horizontal dials over which a dome containing an alarm could be placed at pleasure were in favour. There are several in the British Museum. An early example is shown in Fig. 70. Fig. 71, from the Schloss collection, is of a rather later date. Three springy legs fixed to the alarm were made to clasp the outside of the dial of the timepiece in such a position that a wire depending from the alarm case was moved by the hand at the hour it was desired the alarm should be discharged.



FIG. 69.

The crucifix

Crucifix Clock. clock repre-

sented in the

engraving on page 89 belongs

to Mr. Schloss. The drawing

is one-third of the actual

size of the clock, which

measures twelve inches in

height and six inches across

the widest part. The plinth is made of wood and gilt metal, the top

being covered with cloth or velvet, now very much worn. The cross

is of gilt metal, the figures and mounts of silver. The figure on the

cross is most beautifully modelled. The one standing at the left of

the cross holds in its hands a chalice, which it raises when the clock

strikes the hours. The ball surmounting the structure revolves

once in twelve hours, and on it is a band containing the Roman

hour numerals, the time being indicated by the pointer fixed to

the cross. No minutes are shown, and sub-divisions of an hour

would have to be estimated. The escapement is, of course, a verge.

The clock goes thirty hours between windings, and strikes on a bell below the plinth. Portions of the movement can be seen through apertures in chased metal gratings fixed in the front and back panels of the plinth. There is no maker's name, but it is probably a French seventeenth-century production.

The Key (Fig. 72A) is drawn to the same scale as the clock.

Janvier speaks of the watches made between 1560 and 1590 as being beautifully ornamented and of all sizes, and there is no doubt that by the last named date watchmaking had



FIG. 70.

Dictionnaire de l'Aménagement.

FIG. 71 (A S).

become in France a flourishing art of considerable magnitude. But I am unable to trace any reliable evidence of English watches having been made before quite the end of the sixteenth century, although German and French productions were doubtless imported earlier.

Among the collection of Mr. T. Whitcombe Greene, is an early box-shaped, metal gilt case and dial, probably of German make. Around the projecting bead at the bottom of the case is engraved the following: "Sr. Wm Cooper to Eleanor, daughter of Sr.

Michael Stanhope, wife to Thomas Cooper, his son, of Thurgarton, Co. Nots, 1539." A coat-of-arms is engraved on the cover. The dial is engraved with the figure of the Saviour and emblems of Death, with the mottoes, "Vigilate et orate quia nescitis horam," and "Quælibet hora ad mortem vestigium." ("Watch and pray, for ye know not the hour," and "Every hour is a step towards death") If the dedicatory inscription is an authentic record, this relic



FIG. 72.--Crucifix clock (A S).



FIG. 72A.

certainly represents one of the first table watches seen in England. The case has no bow. Derham, in his second and subsequent editions, mentions an eight-day watch which, he was told, belonged to Henry VIII., but the context clearly shows a weight timepiece is referred to. Among the possessions of Edward VI., as quoted by Wood from a Royal Household Book, is "oone larum or watch of iron, the case being likewise of iron gilt, with two plummettes of lead." The

first words of this description may seem to indicate a watch with a mainspring, but such an assumption is at once dispelled by the mention of the 'plummettes of lead.'

That Elizabeth owned a large number of watches is certain, and the following relating to her horological possessions will be of interest. In 1571 the Earl of Leicester gave to his royal mistress "one armlet or shakell of golde, all over fairely garnished with rubyes and dyamondes, haveing in the closing thearof a clocke." In the same year two other gifts are mentioned, a "juell, being a chrsolite garnished with rubyes and dyamondes, haveing in the closing thearof a clocke"; and "a juell, being a chrsolite garnished with golde, flagon facyon, th'one side sett with two emeraldes, . . . th'other side having in it a clocke." In 1573 Elizabeth received from Margaret, Countess of Derby, "a white beare of gold and mother of perle, holding a ragged staffe, standing upon a toune of golde, whearin is a clocke, the same toune staffe garnished with dyamondes and rubyes." The "clock and all" weighed three ounces. In 1575 Mr. Hatton, captain of the guard, gave the queen "a riche juell, being a clocke of golde, garnished with dyamondes, rubyes in the bottome, and a fayre emeralde pendante sett in golde and two mene perles pendaunte, all ix oz. iii q^a." In 1578 the Earl of Leicester presented Elizabeth with "a tablet of golde, being a clocke fully furnished with small diamondes and rubyes; abowte the same are six bigger diamondes pointed, and a pendaunte of golde, diamondes, and rubyes very smale. And upon eche side losengye diamonde, and an apple of golde enamuled green and russet." In the same year the Earl of Russell gave to the queen "a ring of golde, called a parmadas, sett with vj small diamonds and garnished round about with small rubies and two sparcks of ophalls, and in the same backside a dyall." In 1580 the Earl of Leicester gave her "a cheyne of golde made like a payre of beades concayning viii long peeces fully garnished with small diamondes, and fower score and one smaller peeces fullie garnished with like diamondes; and hanging thereat a rounde clocke fullie garnished with dyamonds, and an appendante of diamondes hanging thearat." In the same year was presented to the queen by Lord Russell, "item, a watche sett in mother of pearle with three pendaunts of goulde garnished with sparckes of rubyes, and an ophall in everie of them, and three small pearles pendaunte." In the same year Mr. Edward Stafford gave her "a little clocke of goulde with a cristall, garnished with sparckes of emeraldes, and

furnished on the back syde with other dyamondes, rubies, and other stones of small value." There were also many humbler contributors to her store. In 1556 her clockmaker Nicholas Urseau, presented "a faire clocke in a case cover with blake vellat"; and her "clocke keeper, John Demolyn, a cloke with a lambe on it of copper guilt."

The following is from an inventory of the possessions of Queen Elizabeth. "A watche of golde sett with small rubies, small diamondes, and small emerodes, with a pearle in the toppe called a buckett, watinge two rubies; a clocke of golde conteyning in the border four table diamonds and two very small rocke rubies, havinge on th'one side foure table rubies and sixe small diamondes; and on th'other side eleven table diamondes, whereof the one is more bigger than the residue. On the one side a man sitting aslepe with a childe before him; a clocke or tablett of golde garnished on th'one side with five faire diamondes and one faier rubie; and on th'other side five faire rubies and one faire emerod garnished with liij little diamonds, and liij litle rubies, with a pearle pendant at it; one clocke of golde curiously wrought and fullie furnished with diamonds, rubies, emerodes, and opalls, havinge in middes thereof a beare and a ragged staffe of sparkes of diamondes and rubies; one clock of gold curiously wrought with flowers and beastes, with a queene on the toppe on th'one side; and on the other side a beare and a ragged staff of sparkes of diamonds, fullie furnished with diamonds and rubies of sundry sortes and bignes; one emerode under it, a faier table diamond with a ragged staff in the foyle thereof and a faier rubie under it squared, and a pearle pendaunt of either side of the clocke; one clocke of golde wrought like deyses and paunseyes, garnished with little sparks of diamonds, rubies, and emerodes, and eight small pearles on the border, and a pendant acorn; one clocke of gold curiously wrought with small sparkes of stones, having on th'one side a horse bearing a globe with a crowne over it; one clocke of golde with a George on both sides garnished with sparkes of diamondes and a pendant of opalls; a litle watche of christall slightly garnished with golde; one litle clocke of golde th'one side being agate with a mouse on the toppe and heddes round about it; one litle watche of golde garnished on the border with very small sparkes of rubies and emerodes with christall on both sides, and a pearle pendaunt garnished with golde like a flesh flye; one rounde clocke of golde enameled with a man on horseback, and divers colors aboute it; a watch of golde garnished with three small diamondes and eight sparks of rubies, with a very little pearle; one little clocke

of golde enameled of the History of Time ; a litle watche of golde, th'one side with a frogge on the topp, th'other side garnished with small garnets like a pomegranite ; one litle clocke sett in eliotropie and garnished with golde ; a litle watche of golde enameled with sundry colors on both sides alike ; a litle watche of christall slightlie garnished with golde, with her Ma'ties picture in it ; one faier flower of golde fully garnished with rubies and diamonds enameled on the backside with a man and a scripture about him having a watch in



FIG. 73.

it and a pearl pendant ; one flower of gold fully garnished with emerods of sondrie bignes and sparkes of emerods and rubies, with thre antique women and five litle perles with a watch or clocke therein ; a watch of agatte made like an egg garnished with golde ; one clocke garnished with golde, being round and sett with 6 table diamondes and 6 rubies in the same border, and garnished with xvij diamondes on th'one side, and 8 diamonds and one rubie on th'other side, lacking two pearles."

Mr. Edward Parr has a watch or table clock dating from about

1581, and probably of English make. It is in a circular case about $4\frac{1}{2}$ inches in diameter as shown in Fig. 73. A large hemispherical bell rises from the space inside the dial ring and the hand is curved down over the bell to read the hour numerals. The head of Queen Elizabeth in high relief, and other chasing, ornament the side of the case. In a ring on the bottom of the case is the inscription :

POSVI DEVM ADIVTOREM MEVM.

(*I have placed God as my helper.*)

Against one of the winding holes is the letter W, and against the other the letter S ; these stand doubtless for Watch and Striking, and strengthens the conclusion that the clock is an early English production.

Skull Watches— The skull watch (Fig. 74) is an excellent example of the fantastic forms in which some of the early makers delighted to encase their work. It is from the Soltykoff collection, and is said to have belonged to Henri III. The case is of crystal, the dial of silver bordered with chased brass gilt, the centre being adorned with what is called *champ-levé* engraving to a floral design. The movement is inscribed Jacques Joly.



FIG. 74

Fig. 75 represents one of the ghastly productions of a larger size. The skull is of silver gilt, and on the forehead is the figure of Death with his scythe and sand glass ; he stands between a palace on the one hand and a cottage on the other, with his toes applied equally to the door of each ; around this is the legend, from Horace :—

“ Pallida mors æquo pulsat pede pauperum tabernas regumque turres.”

(Pale Death visits with impartial foot the cottages of the poor and the palaces of the rich.)

On the opposite or posterior part of the skull is a representation of Time, with another inscription from Horace :—

“Tempus edax rerum tuque invidiosa vetustas.”

(Time, and thou too, envious Old Age, devour all things.)

He has a scythe ; and near him is a serpent with his tail in his mouth, being an emblem of Eternity.

The upper part of the skull is divided into two compartments. On one is represented our First Parents in the Garden of Eden, attended by some of the animals, with the motto :—

“Peccando perditionem miseriam æternam posteris mernere.”

(By sin they brought eternal misery and destruction on the'r posterity.)

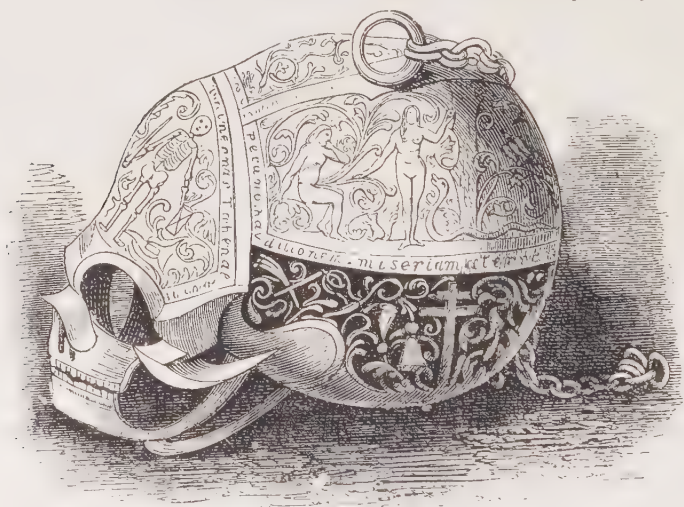


FIG. 75.

The opposite compartment is filled with the subject of the salvation of lost man by the crucifixion of our Saviour, who is represented as suffering between two thieves, whilst the Marys are in adoration below ; the motto to this is :—

“Sic justitiæ satis fecit mortem superavit, salutem comparavit.”

(Thus was Justice satisfied, Death overcome, and salvation obtained.)

Running below these compartments on both sides there is an open work, of about an inch in width, to permit the sound to come out freely when the watch strikes. This is formed of emblems belonging to the crucifixion—scourges of various kinds, swords, the flagon and cup of the Eucharist, the cross, pincers, lantern used in

the garden, spears of different kinds, one with the sponge on its point, thongs, ladder, the coat without seam, and the dice that were thrown for it, the hammer and nails, and the crown of thorns. Under all these is the motto :—

“Scala cœli ad gloriam via.”
(The way to glory is the “ladder” to heaven.)

The watch is opened by reversing the skull and placing the upper part of it in the hollow of the hand, and then lifting the under jaw, which rises on a hinge. Inside, on the plate, is a representation of the Holy Family in the stable, with the infant Jesus laid in the manger, and angels ministering to Him; in the upper part an angel is seen descending with a scroll, on which is written :—

“Gloria [in] excelsis Deo, et in terra pax hominibus bonæ voluntatæ.”
(Glory to God in the highest; on earth peace to men of goodwill.)

In the distance are the shepherds with their flocks. A representation of this cover is given separately.

The works of the watch occupy the position of the brain in the skull itself, the dial plate being on a flat where the roof of the mouth and parts behind it under the base of the brain are to be found in the human subject. The dial is of silver, and fixed within a golden circle richly carved in a scroll pattern; the hours are marked in large Roman letters, and within them is the figure of Saturn devouring his children, with this legend :—

“Sicut meīs sic et omnibus idem.”

There is no date, but the maker's name and the place of manufacture, “Moyse, Blois,” are distinctly engraven on the plate. A silver bell fills the entire hollow of the skull, and receives the works within it when shut; a small hammer, set in motion by a separate train, strikes the hours on it.



FIG. 76.—Interior of skull watch above the dial.

The workmanship of the case is admirable, and the engraving really superb.

The date of this relic may be taken to be between 1550 and 1600.

It is stated that it belonged to Mary Queen of Scots, by whom it was given to Mary Seaton, one of her maids of honour, and much circumstantial evidence adduced in support thereof. I have recently had an opportunity of examining an almost similar Death's-head watch, which is also said to have been the property of the same royal lady and now belongs to Miss Mary Laura Browne, of Anerley. Except that beside the ring on the top of the skull is a screw for the reception of a cross, the case is an exact *facsimile* of the Mary Seaton one, with the additional inscription around the eyebrows, "Ex Dono FR^s. R. FR. AD. MARIAS DE SCOTORUM FR. REGINA." The original movement has, however, unfortunately been replaced by a comparatively modern one.

These two skull watches were doubtless intended to occupy stationary positions; the cross on one of them suggests a *prie-dieu* or small altar in a private oratory. At all events, they are too large and heavy to be worn on the person. The engravings represent the natural size of the relics, each of which weighs over three-quarters of a pound.

In the British Museum are two Death's-head watches, much smaller and with plain cases. One of these was made by Johann Maurer, and the other by J. C. Vuolf. A similar watch, in the Dunn Gardner Collection at South Kensington, is marked Isaac Lenard, and is labelled as sixteenth-century work; another of these extraordinary conceptions, formerly in the collection of Mr. Robert Roskell of Liverpool, and now belonging to Mr. Schloss, is shown in Figs. 77 and 78. The skull or case of silver, much darkened by age, is a startlingly excellent counterfeit and a fine example of silver work. The plate bears the name of the maker thus, "Johann Leudl." On the dial of silver is an engraving evidently intended to portray the day of judgment. Inside the lower jaw, which closes on to the dial, is roughly cut the following inscription: "Lor logeur francoient duducq d'aremberque a mons." This specimen dates from about 1625. In the Vienna Treasury is a small skull watch of the time of the Emperor Rudolph II. in which the movable lower jaw strikes the number of hours against the upper one.

The Rev. H. L. Nelthropp, who presented his splendid collection of watches to the Clockmakers' Company for exhibition in the Guildhall, considers the statements as to the ownership of skull

watches by Mary Queen of Scots to be apocryphal, and says that a careful investigation of the catalogues of the jewels, dresses, furniture, belonging to Queen Mary has proved beyond doubt that watches were not among her valuables. I cannot say that Mr. Nelthropp's criticism is quite destructive of the original account, for if both of the watches were given away by the queen, they could hardly be expected to figure in any subsequent inventory of her property. It is certain that watches were made during her lifetime ; also that Blois was one of the earliest manufactories of watches, and that the family of Moyse flourished there during the sixteenth century. In face of the fact that Elizabeth had such a large number



FIG. 77 (A S).



FIG. 78 (A S).

of watches, it seems almost incredible that the Scottish queen should never have possessed any of the fashionable novelties.

While the probability is that Mary Queen of Scots had watches of some kind, it must be confessed that the statements made respecting her ownership of specimens which have survived will not always bear examination. Among others which tradition has assigned to the Scottish Queen, Octavius Morgan examined two which he considered to be of the period claimed for them. One was a ghastly *Memento Mori* watch in a case of crystal formed like a coffin, and the other an octagonal watch. The latter, which is now in the British Museum, is said to have been given by Mary to John Knox the reformer. The case of crystal had covers front and back

and the movement was inscribed "N. Forfait à Paris." A large oval watch made by F. Le Grand, and said to have been found immediately after the queen's escape from her imprisonment in Lockleven Castle, was exhibited to the Philosophical Society of Edinburgh in 1850. A small circular watch by Estinne Hubert of Rouen, presented, it is averred, by the queen the night before her execution, to a French attendant named Massey, was a few years ago in the possession of Rev. Mr. Torrance of Glencross. In the Massey-Mainwaring collection, is a round rather thin watch by Moysant of Blois, in a case whereon is splendidly painted, in enamel, a representation of the Adoration of the Magi. This watch was some time ago exhibited at the Bethnal Green Museum with a label stating that it was given by Mary Queen of Scots to the Earl of Mar, from whom



FIG. 79.

it passed into the possession of the family of Lord Forbes. But the style of the watch and the enamel painting did not seem to me to be entirely in accord with other productions of the sixteenth century.

In 1575, Parker, Archbishop of Canterbury, bequeathed to his brother Richard, Bishop of Ely, his walking-stick of Indian cane having a "horologium" in the top. This is generally quoted as a watch, but is quite likely to have been a portable sun-dial.

The possession of many watches is ascribed to James I., but such as he did possess do not appear to have been utilized as timekeepers on every occasion, for in Savile's record of a state journey to Theobalds in 1603, it is stated that the king stopped at the Bell at Edmonton, and, wishing to count the number of vehicles passing in a certain time, he "called for an houre-glass."

Fig. 79 shows a tambourine or drum-shaped watch from the collection of M. Paul Garnier. The case, brass gilt, is furnished with a bow, and has hinged covers back and front. The front cover is finely engraved and is pierced over each of the hour numerals on the dial. Inside the back cover is a representation of Christ rising from the tomb, well engraved after the picture by Albert Dürer. The dial is of silver, finely engraved with rays and flames in the centre, beyond which are the hour marks with Roman

numerals from I. to XII. on the outside of the circle, and smaller figures from 13 to 24 within.

In the British Museum is a splendid watch made by Nicklaus Rugendas of Augsburg. The case of metal, gilt, with open work very nicely pierced, is of an oval shape measuring $2\frac{3}{4}$ inches by $2\frac{1}{4}$ inches and an inch and three quarters thick. It is mounted on a plain brass pillar four inches high. The hours are shown on a silver dial, and the minutes on a gilt bevelled outer rim which really forms part of the case. This arrangement and the fact that each five-

minutes space is figured as is the modern custom, may lead to the assumption that the concentric minute indicator was a later addition; but Octavius Morgan, in whose collection the watch was, expressed his conviction (*Archæologia*, vol. xxxiii.) that it formed part of the original construction, and an examination of the hand-work which I have been allowed to make, quite removed a doubt I previously felt as to the correctness of his judgment. The internal arrangement



FIG. 80.—Clock-watch. Type of early German manufacture.

shows considerable ingenuity, every atom or the space being utilized to the best advantage. There are four mainsprings, but no fusee. Between the dial and the movement is a small bell on which the quarter hours are sounded. The hours are struck from one to six and then over again in conformity with what was formerly an Italian method of computation, the hour bell being oval to suit the shape of the case; at the back is a large bell on which an alarum may be rung. The train wheels are of brass and the quarter part of steel. Mr. Morgan considered this watch to be a production of the second quarter of the sixteenth century, but the

general style of the work and the construction of the movement negative such an assumption ; 1610 or a little later would be nearer the correct date. Messrs. Patek Phillipe and Co. have an octagonal calendar watch by the same maker, which, judging from a photograph of the movement, I should say was produced about 1630.

In the Vienna Treasury is a clock marked "Nicklaus Rugendas junger," dating from the middle of the seventeenth century.

Fig. 80 is an exterior view of a large circular clock-watch in the possession of Mr. Evan Roberts. It is unnamed, and is most



FIG. 81. French astronomical watch.

FIG. 82.

probably of German or Dutch origin ; the steel dial and brass open-work case are very fine, as may be judged from the drawing. The stackfreed and the wheels are of steel and the plates of brass.

This watch has been pronounced to be a production of the second quarter of the sixteenth century, and the construction in many respects agrees with that period.

Adam Thomson mentions an interesting astronomical watch of French make which is shown in Figs. 81 and 82. It has a silver case highly ornamented, with mythological subjects elaborately

chased, bearing the following inscription on the inside of the back cover : " From Alethea Covntess of Arvndel, for her deare sone, Sir William Howard, K.B. 1629." It is of an oval form ; the extreme size two inches and a half, and an inch and a half in thickness. It struck the hours and has an alarum ; showed the days of the week, the age and phases of the moon, with the days and months of the year, and the signs of the zodiac. On the inside of the front cover there is a Roman Catholic calendar with the date 1613. The watch movement is inscribed " P. Combret, à Lyons." A watch by Combret with a shell-shaped silver case is in the South Kensington Museum.

Below and on pages immediately following are shown some examples of curiously shaped watches.

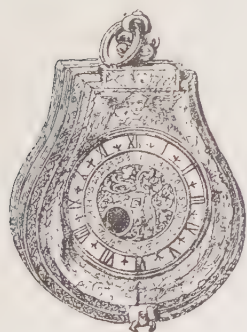


FIG. 83.



FIG. 84.

Fig. 83, from the Bernal collection, which was dispersed by auction in 1855, is in the form of a padlock. It has a crystal front and ribbed crystal back ; gilt metal engraved mounting, dial of gilt metal ; the days of the month are noted on a silver circle, with a steel plate apparently for the moon's age. The maker's name is Gio. Batt. Mascarone, and it is probably sixteenth-century work.

The book-shaped watch shown in Fig. 84 was also in the Bernal collection, and belonged to Bogislaus XIV., Duke of Pomerania, in the time of Gustavus Adolphus. On the dial side there is an engraved inscription of the Duke and his titles, with the date 1627, together with his armorial bearings ; on the back there are engraved two male portraits, buildings, etc. The covers are of brass engraved ; the clasps and other ornaments are of silver ; the dial is of

silver, chased in relief; the insides of the covers are chased with birds and foliage. There are apparently two separate movements, and a large bell at the back; over the bell, the metal is ornamentally pierced in a circle with a dragon, etc.; the sides are pierced and engraved in scrolls. The maker's name is "Dionistus Hessichti." In the British Museum

is a book-shaped watch dated 1550.

Of other more quaint and grotesque designs for watch cases favoured by the early makers may be mentioned one in the form of an eagle, which was in the collection of Lady O. Fitzgerald. It illustrated the story of Jupiter and Ganymede, and could either be suspended from a ring in the back of the bird or rested by its claws on a flat surface. In the British Museum is a watch shaped like an acorn, another resembling a dog, and one with silver cases made in imitation of cockle-shells. In the South Kensington Museum is a French watch resembling a pelican, and a diminutive timekeeper in the Mainwaring collection is concealed in one of two enamelled cherries with stalks connected.

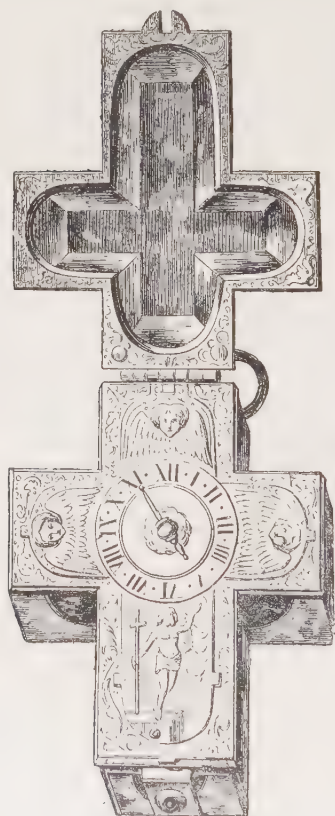


FIG. 85.

Memento Mori watches in the form of a Latin cross, and usually with scenes from the life of the Saviour engraved on the dials, were for a long period a favourite pattern, especially with French artists, among whom they were known as *montres d'abbesse*. Dubois says cruciform watches were probably devised by Myrmécides, a watchmaker of Paris, who flourished between 1530 and 1550, and whose name appears on several early specimens. They appear to have been worn, generally, on the breast, and are often spoken of as pectoral cross watches. Of three in the British Museum, one, in a case of rock crystal, very similar to Fig. 85, was made by Jean Rousseau the



FIG. 86 (A S).

FIG. 87 (A S).

is mentioned a Latin cross watch by the celebrated Johannes van Ceulen, which has a cover of crystal and is enamelled in opaque colours; on the front the Man of Sorrows and emblems of the Passion, and on the back the Crucifixion.

Of three cruciform watches in South Kensington Museum, one dating from about 1590 is signed "Senebier"; another of slightly later date bears the initials "N.R.," and the third, which forms part of the Salting collection, has a silver and crystal case, and is by Charles Bobinet, a French seventeenth century maker of repute.

Fig. 88 is a front view of

elder about 1580; another, also a sixteenth-century production, is by Tinnelly, Aix; the third dates from the latter part of the seventeenth century, and is cased in emerald glass. A very small pectoral cross watch from the collection of Mr. Schloss, is shown in Figs. 86, 87. It is in the sixteenth-century style, and the movement is signed "Schultz, Augsburg."

In the *Archæological Journal*



FIG. 88 (A S)

a specimen of unusual size. This is certainly too large and heavy to have been worn on the breast or otherwise attached to the person, and was probably stationed on a *prie-dieu*. Its construction is peculiar; there are no fewer than ten hinged covers, composed of brass framing filled in with crystal having bevelled edges. One cover is over the front and the other nine are shown open in Fig. 89, which is drawn to one-half of the actual size. The back plate is is

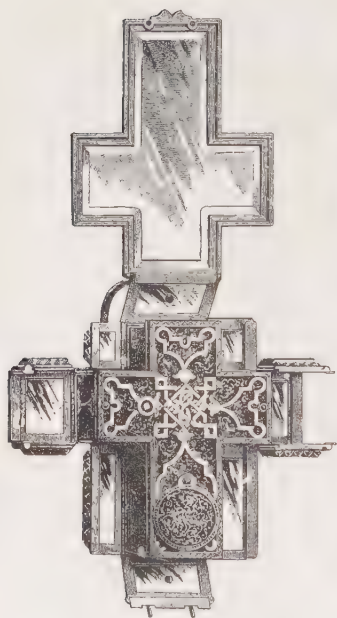


FIG. 89 (A.S.).

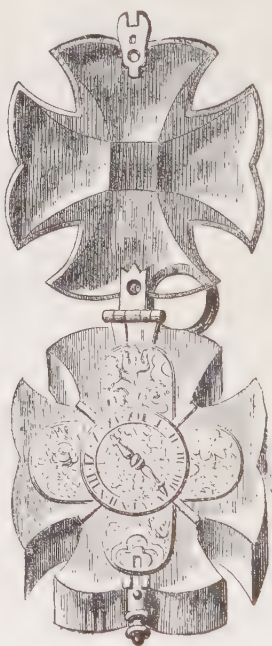


FIG. 90.

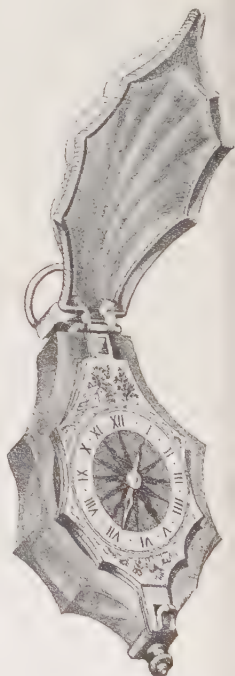


FIG. 91.

covered with perforated steel work, and the balance cock is of steel also. It is unnamed, and some parts of the mechanism appear to be eighteenth-century work.

The Maltese Cross watch, Fig. 90, from Dubois' historical work, is a sixteenth-century production of French origin, and a much rarer form than the Latin cross.

A very early crystal case watch by Thomas Franck, from the Soltykoff collection, is shown in Fig. 91.

In Fig. 92 is shown a clock watch by Conrad Kreizer, from the Soltykoff collection. The case is of crystal, the dial of silver, and the cover of brass gilt. A peculiar feature is the oval raised pierced work of brass, introduced evidently to allow the sound of the bell to



FIG. 92.

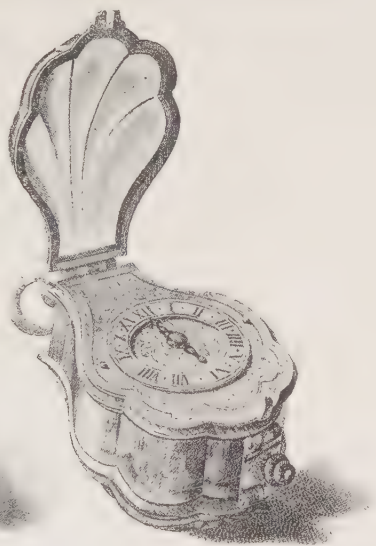


FIG. 93.

be heard more distinctly. The movement is of a primitive character, and the maker is said to have been contemporary with the brothers Habrecht. An octagonal watch in the South Kensington Museum, signed "Conradt Kreizer," is certainly early seventeenth century work.

The crystal case watch in the form of a cockle-shell, shown in Fig. 93, also from the Soltykoff collection, is a late sixteenth-century production. It has covers back and front, the dial is gilt, with silver hour band and steel hand.

Another specimen from the Soltykoff collection, in a crystal escalop case, shown in Fig. 94, has very primitive mechanism, by *Phélisot*, *horloger de la ville de Dijon*. The

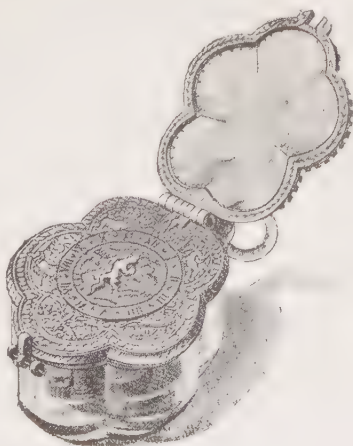


FIG. 94.

dial, finely engraved, is of silver, with gilt hour band ; the hand is in the form of a lizard.

The pear-shaped watch shown in Fig. 95 was made by Conrad Kreitzer of Strasbourg, and is also gathered from the Soltzkoff treasures. A similar watch is in the British Museum.

The circular specimen shown in Fig. 96, selected from the same repository as the preceding, has covers back and front ; around the band are figures typical of spring, summer, autumn and winter. The dial is of silver gilt, with a white band on which the hour numerals are engraved. In the centre of the dial is engraved a representation of Christ and the woman of Samaria ; on the upper cover is portrayed the spectacle of Mary Magdalene washing the



FIG. 95.



FIG. 96.

feet of Jesus, and on the lower cover another Biblical scene. The movement is inscribed "James Vanbroff," and it dates from about 1605.

Fig. 97, with crystal case in the form of a *bonbonnerie*, is from the Soltzkoff collection. From the movement, which is inscribed, "Denis Bordier," one may judge that it was made about 1630.

Of all the quaint fancies exhibited in the formation of early watch cases, none are, I think, more charming than the various floral designs popular during the sixteenth and seventeenth centuries.

The opening tulip bud, from the Soltzkoff collection, which is shown in Fig. 98, must be admitted to be a very pretty artistic conceit. The dial and the covers or leaves are of silver, and so is the twisted stalk that forms a ring for the attachment of a chain or

cord. The movement bears the name of Rugend of Auch, and dates from the beginning of the seventeenth century. A very similar specimen by Bayr, who was, I think, a Dutch maker, is to be seen in the British Museum.

A larger counterfeit of the same flower appears in Fig. 99. The body of the case is of gold, and there are three bezels or covers of

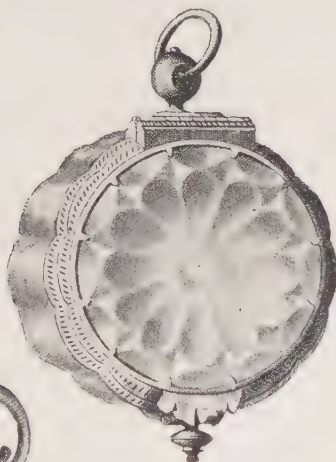


FIG. 97.

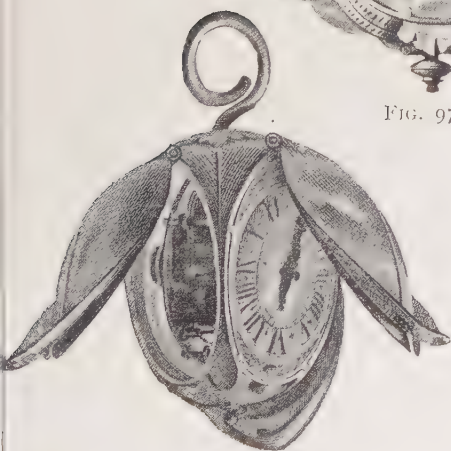


FIG. 98.



FIG. 99.

silver, each comprising a piece of rock crystal formed in the shape of a tulip petal. The hand is of gold, the dial of silver, with a landscape engraved thereon. Through one cover the dial is seen, and through the other two the movement is visible. It has a three-armed steel balance and a balance-spring. Jean Rousseau the younger, who is said to have died in 1684, was the maker of this

watch. The presence of a balance-spring would therefore stamp it as one of his later productions.

There is a splendid tulip watch among the Nelthropp collection at the Guildhall Museum, without a balance-spring, by F. Sermand, dating from about 1650; another at the South Kensington Museum, and one at the British Museum by Henry Ester.

A very pretty floral watch of an early date, from the Soltykoff collection, is shown in Figs. 100 and 101. The case is gold, adorned with fine floral ornaments in green and Cassius purple enamel on a white ground. The dial is of gold, decorated also in green and purple enamel on a white ground. The plates and train wheels of the movement are of brass. It is provided with a fusee with cat-gut and a circular balance. The movement is signed "J. Jolly," and dates from about 1600. Fig. 100 shows the dial and hand fairly

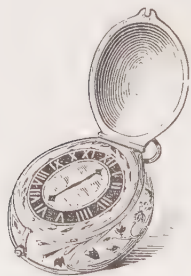


FIG. 100.



FIG. 101.



FIG. 102.

well, but does not give a good idea of the elegant form of the case, which will be better gathered from Fig. 101, which is a back view with the cover open.

Fig. 102, another diminutive watch of a later date from the same collection, is in the shape of a poppy bud. The case is of amber with mountings of gold, finely engraved and maintained on the amber by means of close gold wire running down the angles to the knob which holds the ring on which the chain is to be fastened. The dial is of silver with enamelled ornaments; it is covered with a piece of rock crystal fitted in a bezel.

In the British Museum are three watches in the form of insects or fitillary flowers. One labelled as English work by Edward Bysse, is in a nielloed silver case. Another, also English, in a silver case, is by Thos. Sande.



FIG. 103 (A S)

The watch case in the form of a basket of flowers (Fig. 102) is of gold enamelled and studded with diamonds.

Figs. 104 and 105 represent an olive-shaped watch belonging to Mr. Schloss. The case of gold is beautifully enamelled in green and dark blue.

Three views are appended, the exact size of an exceedingly diminutive watch. Its dial and tiny case of gold are beautifully decorated with *champ-levé* enamel, and the movement is fitted with

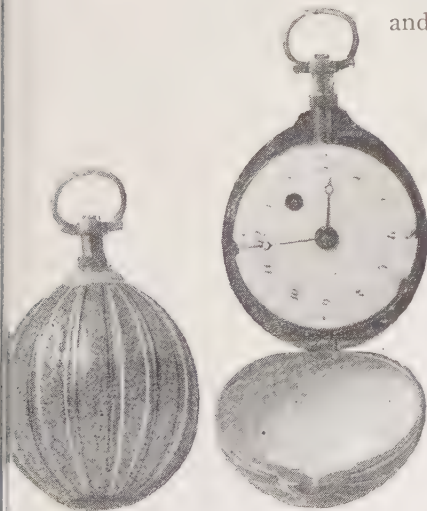


FIG. 104 (A S).

FIG. 104A (A S).



FIG. 105.

the primitive "stackfreed" for regulating the force of the main-spring (Fig. 105).

A pretty star-shaped watch, decorated with enamel and pearls, is shown to two-thirds the actual size in Fig. 106.

The miniature watch sur-

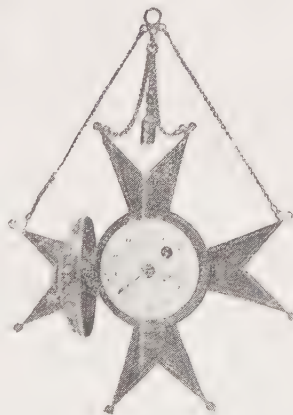


FIG. 106 (A S).

rounded by a horn or trumpet (Fig. 107) is engraved to the actual size.



FIG. 107 (A S).



FIG. 108 (A S).

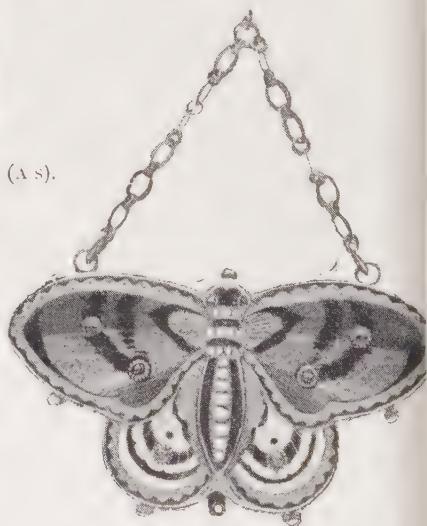


FIG. 109 (A S).

Front and back views of a superb specimen in the form of a butterfly, are given in Figs. 108 and 109. It is impossible to give

more than an idea of the choicely enamelled back by reproduction in black and white.

Most of these "toy" watches are of French origin. It is curious to note in eighteenth-century advertisements the references to the sellers of them as "toymen."

Irregular shaped octagonal watches are met with among the productions of the latter part of the sixteenth till quite the close of the

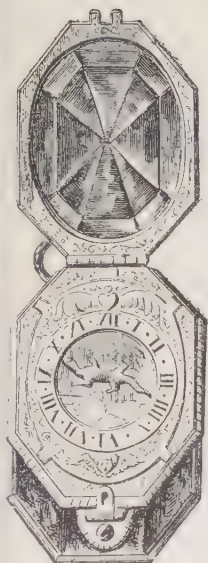


FIG. 110.



FIG. 111.

seventeenth century. Many variations in the size and material of the cases were made by French and afterwards by English artists to suit their own tastes or the desires of their patrons; the cover was often of crystal, lapis lazuli, agate, or other semi-precious stone. The crystal case specimen (Fig. 110) is an early one, apparently of French origin. Another, from the Soltykoff collection, is shown in Fig. 111. The covers are of silver, and by means of a second dial

and two small apertures in the dial plate, it indicated the sign of the zodiac corresponding to the month, the day of the month, the day of the week, and planetary motions. It also struck the hour and provided an alarm. It is unnamed, but probably late sixteenth-century work. Figs. 112 and 113 represent two superb specimens of English make. The first, in a case of crystal with gilt brass mountings, is in the possession of Messrs. Lambert, of Coventry

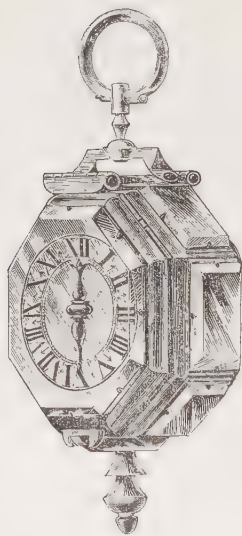


FIG. 112.—Watch by Jeremie East, about 1600.



FIG. 113 (VS).

Street, who allowed me to examine it. On the plate of the movement is inscribed, "Jeremie East, fecit," and it is, I should say, a very early example of English work, dating from not later than 1600.

Fig. 113 has a case of solid crystal with brass mounts and finely engraved dial. The movement is inscribed, "Nicasius, London," and dates from about 1605.

In the British Museum is a choice octangular watch, dated 1620, by the celebrated Edward East. The body, as well as the cover of

the case is of crystal, faceted, and the exterior altogether closely resembles Fig. 112. Another, somewhat similar, but dated 1609, is inscribed, "Michael Nouwen, London." A watch of this shape is said to have belonged to Abbot Whiting. It is engraved in Warner's "History of Glaston Abbey," and on the inside of the cover appears the inscription, "Richard Whytinge, 1536." Warner seems to have accepted the inscription, but beyond this there is really no evidence except a seal attached to the watch by a string, and this is certainly not conclusive. I do not believe such a watch was made so early as 1536.

Fig. 114 is from the collection of M. Paul Garnier. The square case has a ground of blueish steel, overlaid with chased gold ornament, the combination producing a very striking effect. The edges are decorated in the same way. The dial is square, enamelled blue in the centre and white all round, the corners being adorned with *motifs* in red enamel. The movement is signed "Balthazar Martinot," who was horologer of Louis XIII. in 1637. Steel cases with gold filagree work attached were rather popular at the middle of the seventeenth century. Among others in the British Museum is a choice specimen by Benjamin Hill.



FIG. 114.

Oval Watches.

From the designation "Nuremberg eggs," which is often applied to watches of a flattened oval form, it may be supposed that they originated in Nuremberg. They appear to have been manufactured here as early as 1600. In Fig. 115, page 114, is an excellent specimen from the collection of Mr. Evan Roberts. The dial is of finely engraved silver, and has mounted thereon a brass hour ring. At each hour, near the exterior edge of the ring, is a slight knob to allow of the time being ascertained by feeling the hand and estimating its position with relation to the knobs. Over the hour ring is the engraved inscription, "Our time doth passe away." A hinged cover of silver, fastened with a forked snap, secures the hand from accidental interference as it takes its course round the dial. The movement and wheels are of brass; a piece of catgut connects the fusee and barrel, and there is no controlling spring to the balance. The balance cock is of a width to cover the balance,

and is handsomely pierced. A bracket or cock, perforated to a similar design, is spread to cover the click for the barrel ratchet. The pillars are round and solid, with nicely engraved square bases and caps. The detent for the fusee stop is also well wrought to match. On the upper plate is engraved, "Thomas Aspinwall, fecit." The name of Aspinwall is not unknown among the celebrated early English watchmakers; it is recorded that in 1675 Josiah Aspinwall was admitted as a brother of the Clockmakers' Company. His admission as a "brother" probably signifies that he was free of one of the other City Guilds. In 1863 Lord Torphichen exhibited, at the Archaeological Institute, a clock-watch made by Samuel Aspinwall, of a date presumably about 1650 or 1660. But I should be inclined to place this watch as among the productions of a much earlier date.



FIG. 115.

Messrs. Grimshaw and Baxter showed me a few years ago a watch very similar to the one here depicted, on which was engraved, "Samuel Aspinall, fecit." Bearing in mind the vagaries of seventeenth-century ortho-

graphy, we may assume that this was a member of the same family.

Oval or egg-shaped watches were usually worn on chatelaines. They were apparently more popular than any other form from 1610 to 1625, and continued in fashion with the fair sex for a long time. In Hollar's plates of the four seasons, dated 1641, summer is represented by a lady having an egg-shaped watch on her left side depending from her girdle. The British Museum contains several similar specimens, most of which are assigned to the first quarter of the seventeenth century. One, by Nicholas Waller, is dated 1610. Another, almost a counterpart of the one illustrated in Fig. 116, is by John Limpard, and was made about 1610. It is calculated for going sixteen hours between wind-



FIG. 116 (A.S.).

ings. The case is of silver, partially gilt and very elegantly chased ; on one side is a figure representing Hope, and on the other a corresponding figure of Faith.

An exterior view of an oval watch by Simon Bartram is given in Fig. 116. The circular patch on the left is a "hit or miss" shutter, which covers the winding hole to prevent the ingress of dirt. This shutter is a characteristic feature of early seventeenth-century watches. It had to be moved round when the watch was wound, and on completion of the operation was replaced. The dial is very similar to that shown in Fig. 115. A drawing of the movement, which is of particular interest, will be given later on.

Fig. 117 represents a watch by Wm. Nash, London. It belongs to Mr. Edward Parr and dates from about 1605. The case is of brass.

There is a very small oval watch in the British Museum. It measures but half an inch across by three-quarters of an inch long, and has plain silver capsule-shaped outer cases. The South Kensington Museum contains a still smaller one.

Early in the seventeenth century plain circular watch cases came into favour, but not to the entire exclusion of more fanciful shapes.



FIG. 117.

Salt Cellar Clocks.

In the early part of the seventeenth century, it was apparently the custom to have clocks combined with salt cellars on the table at state banquets, to judge by the following curious items from an inventory of the plate in the lower and upper jewel rooms of the Tower, 1649: "A salt of state with a clocke in it, valued att £12 0 0; a clocke salt with a christall case, supported with 4 pillars, silver-gilt, valued att £4 10 0; an aggatt salt and cover

garnisht with gold, enamelled, supported by 3 men, and a shipp on the top of the cover, p. oz. $10\frac{1}{2}$ oz., valued att £33 0 0; two clocke salts standing upon 4 christall balls and 4 christall pillars, each with aggatt salts on the topp, and gold covers, p. oz. 3 lb. $2\frac{1}{2}$ oz., valued att £3 6 8 per oz. = £77 0 0; a christall watch salt garnisht with gold, and supported with 3 faces with several fruiteages hanging about them, p. oz. 30 oz., valued att £30 0 0."

Pockets were used for the reception of timekeepers in Shakespeare's time, for Jaques, in "As you like it," remarks, "And then he drew a dial from his poke."

Portable sundials, sometimes with a compass attached, were then made, and the reference was probably to one of these.

Watches were not usually carried in the pocket for more than a century after the mainspring was invented. The larger ones would be kept on a table or cabinet, and the smaller kinds, when worn on the person, were originally held by a chain around the neck, or attached to the dress in other ways, unless incorporated with bracelets and such-like ornaments, as many of Queen Elizabeth's seem to have been.

The grotesque and uneven cases applied to most of the early watches clearly rendered them unsuitable for the pocket. Decker in 1609 (Gull's Hornbook), apostrophizing the fashionable young bloods idling in the cathedral, says, "Here you may have fit occasion to discover your watch by taking it forth and setting it to the time of St. Paul's." This suggests a pocket, but long after this date oval and round watches were made with a pointed projection depending from the bottom of the case, and these were clearly never intended for the pocket, nor fit for it. The fob, from the German *fuppe*, "a small pocket," was very possibly introduced by the Puritans, whose dislike of display may have induced them to conceal their timekeepers from the public gaze. This conjecture is strengthened by the fact that a short "fob" chain attached to a watch of Oliver Cromwell's, in the British Museum, is, in point of date, the first appendance of the kind to be found. The watch is a small oval one, in a silver case, and was made about 1625, by John Midnall, of Fleet Street, who was one of the first members of the court of the Clockmakers' Company, and warden in 1638. On one side of a silver plate at the seal end of the chain are the Cromwell arms, and on the other the crest of the Protector with the letters O.C. as shown in the appended engraving, Fig. 118. The Cromwell crest was a demi lion holding a ring in its paw, but the Protector substituted for the ring the handle of a tilting spear as here represented.

This watch and chain formed part of the Fellows' collection. By the will of Dame Harriet Fellows (relict of the late Sir Charles Fellows), late of West Cowes, Isle of Wight, who died in 1874, the testatrix bequeathed to the trustees of the British Museum, her collection of watches, to be placed and held with Milton's watch, bequeathed to them by her late husband.

Fig. 119 is an illustration from the *Illustrated London News*,

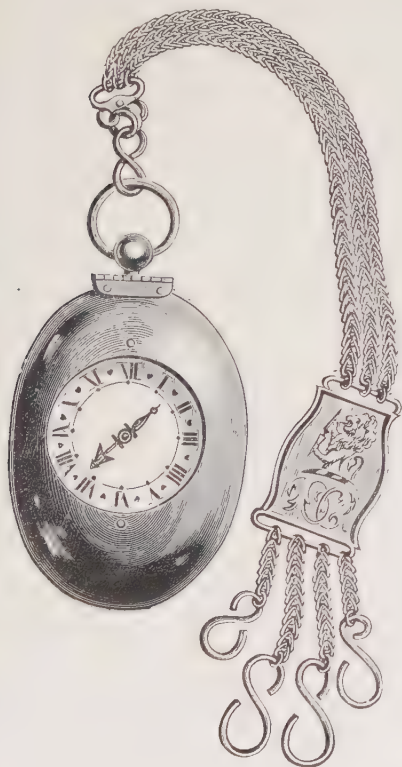


FIG. 118.—Oliver Cromwell's watch and fob chain.



FIG. 119.—Clock-watch of Oliver Cromwell.

Feb. 1850, of a clock-watch which is said to have belonged to Oliver Cromwell. It is, I believe, the property of Mr. J. H. Fawkes, of Farnley Hall, and bears the name of Jaques Cartier. The outer case of leather is perforated and studded with silver.

In the South Kensington Museum is a circular clock-watch by Johannes Bayes, which probably belonged to Cromwell's secretary. The outer case of tortoiseshell bears the inscription "Johne Pyme, hes watch, A.D. 1628. "

**Watch
Glasses.**

Watch glasses seem to have been introduced about 1610. At first they were flat, rather thick, and fitted into split bezels, as the containing rings are called, the opening in the bezel being at the middle of the joint, so that the corresponding knuckles of the case would keep the slit tightly closed on to the glass. Glasses of this kind are found on oval watches, and also on circular ones with dials much smaller than the cases, which were a fashion at the beginning of the seventeenth century. Then followed the high, rounded glasses, which were cut from spheres. Afterwards came the bull's-eyes, with a circular flat centre; these, which were of German origin, gave place to the flatter "lunettes" from France, such as to-day divide popular favour with the thick "crystal" glasses.

Glasses were apparently used for table clocks some years before they were applied to watches. German and French table clocks, dating from the latter part of the sixteenth century, are occasionally to be met with having glasses over the dials, and some octagonal ones with glass panels in the sides. But the innovation did not at once prevail, as table clocks, either without any covering over the dial, or with metal covers, were made long after the first examples with glasses, and watches with metal covers continued in fashion till the middle of the seventeenth century. *

In the British Museum is an oval watch by Guy Mellin, Blackfriars, the dial of which is covered with a glass in a split bezel; also a circular watch by John Duke, Fleet Street, with a dial one-half the size of the case, and a glass of corresponding size fitted into a split bezel. Mellin's watch is considered by the authorities to have been made about 1600, but I should be inclined to put the date of its production a few years later. Several other watches, whose manufacture is ascribed to the beginning of the seventeenth century, may be noticed with glasses; but these adjuncts in some instances have been subsequent applications. The split bezel is perhaps a tolerable criterion of originality, but it does not absolutely follow that such a bezel was originally fitted with a glass, for the frames of early watches and clocks were occasionally furnished with crystal.

Another method of fixing the glass prior to the introduction of the present practice of springing or snapping it into the bezel consisted of forming three or four thin metal ears on the bezel and bending them over the glass when it had been placed into a suitable rebate. I saw this in a watch by Benjamin Hill. It was, however, but a survival of the mode in which crystal was held in octagonal

and other fancy cases, and must be regarded as an inferior arrangement which does not seem to have been at all general, whereas the split bezel was used preferentially by some makers long after the custom of snapping the glass in was introduced. The watch shown in Fig. 208, and made about 1700 by the celebrated Langley Bradley, has a split bezel.

The convenience of the "fob" to those who carried **Watch Cases.** watches for use rather than for ornament, was soon apparent, and its adoption speedily became general with men, though ladies continued to wear their watches suspended from chatelaines till the latter part of the eighteenth century. In 1749 Benjamin Cartwright patented a secret spring to secure a watch hanging by a lady's side.

Like many other fancies, the one of wearing two watches is but a revival, *pace* the *Universal Magazine* for 1777, where the description of a "modern fop" includes—

"A lofty cane, a sword with silver hilt,
A ring, two watches and a snuff-box gilt."

It will be observed from the preceding examples that a great number of dissimilar materials were used to enclose portable time-keepers: wood of various kinds, precious and semi-precious stones, amber, metal and leather were all utilized for this purpose. With few exceptions the earliest watches had but a single case. Metal was the predominating material, the plainest cases being usually of brass, or of polished steel; silver also was favoured both for smooth and engraved cases; for the more costly coverings gold was of course selected, either by itself or in combination with precious stones, and occasionally the two precious metals would be used together with pleasing effect.

Sometimes the watch movement, instead of being fastened to the case, was simply placed in, four tenons which projected from the edge of the dial fitting into corresponding mortices in the middle band of the case. The case then had two hinged covers, one over the dial and one over the back, the movement being rendered secure by the closing of the front cover; the back cover had to be opened to wind the watch. The crystal cased watch by Jeremie East, Fig. 112, one by David Bouquet in the Mainwaring collection, and another by David Ramsay in the South Kensington Museum, are examples of this method. But more often the movement was joined to the case by means of a hinge near the pendant and a spring bolt at the opposite point of the dial, four projecting tenons on the dial resting in notches cut from the middle of the case. This mode of con-

struction is clearly shown in the engraving of the oval watch by Thomas Aspinwall on page 114. Till about 1720 the spring bolt generally projected through the dial, after that the nib for unbolting was more often arranged outside the circle of the dial and below the surface of it.

Decoration in enamel is sometimes to be found on watch dials and cases produced during the early part of the seventeenth century. An exceptionally good specimen is shown in Figs. 120 and 120A. The outside of the cover and the back are embellished with enamel, the ground being



FIG. 120.—Closed front, with cover (A S).



FIG. 120A.—Dial and inside of cover (A S).

of turquoise blue with white arabesques moulded thereon in relief and studded with fine garnets of large size. Though "jewelled watches" are referred to as belonging to Queen Elizabeth and in other records of the period, it is very rarely that so early a combination of enamel and gems is now to be met with. The inside of the case and of the cover are also painted in enamel, and so is the dial. There is no glass over the dial. The hand is well shaped. The plate of the watch is inscribed *Pierre Soret*.

Front and back views of a watch covered with the same kind of enamel of later date are given in Figs. 121 and 121A. The centre of

the dial is blue and a portrait on an enamelled plaque occupies the centre of the back. A very thin name plate on the movement is engraved "James Coupé, London," and underneath the name plate appears the signature "Marc Grangier."

By permission of Mr. Charles Shapland, I am enabled to give a



FIG. 121 (A S).



FIG. 121A (A S).



FIG. 122.

representation, so far as it can be done in black and white, of a choice specimen in a different style, dating from about 1630. On the top plate of the movement is the inscription "Georius Merckell, Dantzig." As will be seen from the engraving (Fig. 122), the bezel is split at the joint for the reception of the glass, and the bolt is of the early exterior kind; but the particular feature of the watch is the superb enamelling. The case is of fine gold, and is wholly

incrusted with enamel both inside and outside, flowers of various colours and kinds, as well as winged insects, are most charmingly represented. A glimpse of the style may be gathered from the part of the edge which is shown. The pendant, which is a fixture and without a separate bow, is also coated with enamel. The dial, of the same material as the case, is beautifully enamelled to a floral design somewhat as delineated.

Of other kinds of enamelling to be met with but rarely on early seventeenth-century watches may be mentioned *champ-levé*. This somewhat resembles the well-known *cloisonné*, but, instead of the various sections being divided by the insertion of metal strips, the partitions are solid with the base, and the intervening spaces cut out to receive the enamel. An example is given on page 109.

Occasionally translucent enamel was employed, and effects of light and shade obtained by varying the depth of a cavity which was cut to the required design in a metal base.

But about 1635 a new process of painting in opaque enamel was introduced which was particularly suited for watch decoration and shortly led to more elaborate casings. It consisted of applying to thin gold plates thick colours of different tints which would melt with fire and yet retain their lustre. The discovery of this beautiful art is claimed for John Petitot, who was born in Geneva in 1607 and attained much success as a miniature painter in Italy and in England. It is also stated to be the invention of Jean Toutin, a goldsmith of Château Surr, who was previously distinguished for painting in enamels, and who certainly seems to have been the first to apply it to watches. Other French artists quickly devoted themselves to the new kind of enamel painting. Among those who excelled in it may be mentioned Henry Toutin, brother of Jean, a goldsmith and enameller at Blois; Dubie, a court goldsmith who worked at the Louvre; Paul Viet, of Blois; Morlière, a native of Orleans, who worked at Blois; Robert Vauquer, a pupil of Morlière, and of pre-eminent ability, whose enamel painting has never been excelled either for colour or design, specimens are highly prized and but rarely to be met with on watch cases; Chartière of Blois, who was noted for his painting of flowers; and the brothers Huand, of whom Huand le puisné was particularly celebrated for figure-painting. Several examples are to be found in the British and South Kensington Museums. Among those in the British Museum may be cited a representation of some nymphs bathing, excellently executed in enamel by Jean Toutin; also an enamelled watch case, very finely

painted by Henry Toutin, illustrating the story of Tancred and Clorinda in "Orlando Furioso"; another by the same artist treats of the "History d'Apain"; a watch by David Bouquet, a well-known London maker, the case being ornamented with flowers in relief, and enriched with diamonds; a very finely enamelled watch case, illustrating the early life of Christ; two cases painted in enamel by Huand le



FIG. 123.



FIG. 124.—Back of watch by G. Achard et Fils, Geneva. Enamel painting studded with diamonds (A S).



FIG. 125.—Back of French watch. Enamel painting studded with diamonds; surmounted by a bust of Louis XVI. (A S).

puisé; a very thick rounded watch by Tompion, with case splendidly painted in enamel by Camille Andre. In the Vienna Treasury is a watch case finely enamelled inside and out by the brothers Huand.

Some representative examples of French, Swiss and English enamel are appended. A choicer piece of flower painting on enamel than is shown in Fig. 123 it has never been my good fortune to see. This watch belongs to the Hon. Gerald Ponsonby, by whose

permission it is illustrated. It is a *sourdine* repeater by Julien Le Roy; the hands, bow, push piece at pendant, thumb piece and *sourdine* toucher are all set with diamonds.

Fig. 126 shows the back of a thin watch by "Gregson, Paris, horloger du Roy." The case is enamelled on gold, the outer part rayed and covered with royal blue translucent enamel; on a medallion of opaque enamel in the centre is a well painted group with Cupid and a dog, denoting love and faith. It is characteristic



FIG. 126.—Enamelled watch by Gregson
(A S).



FIG. 126A.—English enamelled watch
(A S).

of the Louis XVI. period. This style of enamelling was then quite in fashion. Fig. 126A shows an English watch, with the London hall mark corresponding to 1787. The margin is of translucent royal blue as in the preceding example.

Battersea enamel dates from about 1750, when Sir Theodore Janssen, who was Lord Mayor of London in 1754, established a manufactory at York House, Battersea. Horace Walpole described his collection as "stamped with copper plates." Transfer printing may have been employed for flat surfaces, but certainly not for watch cases, the painting on some of which was by artists of note. A very good example is shown in Fig. 129. Back and front views of a very choice little watch by Hughes, London, of a slightly later period, are given in Figs. 130 and 130A.

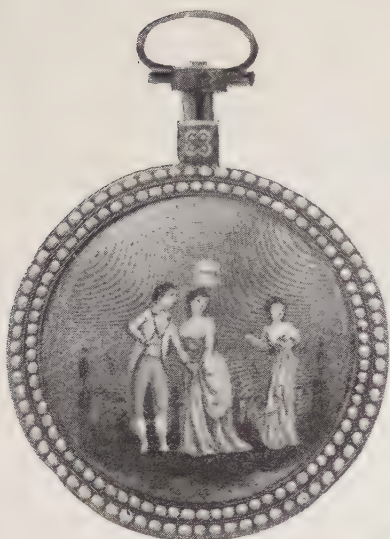


FIG. 127.—Enamel bordered with pearls (A S).



FIG. 128.—Enamel painting on back of watch by Breguet (A S).



FIG. 129 (A S).



FIG. 130 (A S).



FIG. 131A (A S).

Watch dials of enamel, with pictures painted in bright colours inside of the hour ring and occasionally outside of it, proved very attractive between 1760 and 1800. They were inexpensive and as a rule of but little artistic merit, the most favoured designs being those in which shipping and seaports were introduced. Many thousands of these were produced for the Dutch market by English watch makers.

To protect the surface of the enamel, watches with **Pair Cases.** covers decorated in this way were generally provided with an additional case, and from this time the practice of adding a loose outer case to watches, forming what are called "pair cases," continued to the early part of the present century.



FIG. 131.—Flat chasing on outer case of watch by William Scafe (A S).

Gold loose cases, with designs chased in *repoussé*, were at this period an important art in connection with watchmaking. Chasing as distinguished from engraving and carving is the formation of ornament in relief by punching or pressing instead of cutting away the material. It is a very ancient art, and chased ornament is to be found on some of the earliest of watch cases.

The silver chased work applied to the edges of English oval cases at the beginning of the seventeenth century is said to have been imported in strips from France.

An excellent outer case, decorated with flat chasing and enclosing a watch by William Scafe, is shown in Fig. 131.

In *repoussé* chasing the material is punched or pressed up from the back, whereby the design is obtained in higher relief than is the case with the ordinary method of punching from the face. Much of the work on old clocks which at first sight appears to be engraving proves on examination to be chasing. All the small numerals on Habrecht's clock at the British Museum are stamped. Some very choice specimens of *repoussé* work, marked "H. Manley" in very small characters, are in the British Museum. Among the signatures on other fine examples may be mentioned Parbury, Cochin, and Moser,

but as a rule decorative work of this kind bears no indication of the producer. Some examples are given below and on pages 128, 184.

Occasionally cases decorated in *repoussé à jour* are to be met with, some of the best of them being the work of Dutch artists, but this form of ornament is hardly suitable for watch cases, as it affords no protection against the ingress of dirt, unless a separate lining is employed. For striking watches, apertures of course serve a useful purpose.

A combination of chasing and engraving was also effectively employed in the embellishment of gold cases; some of the choicest specimens of early eighteenth-century work which survive being the work of George Michael Moser.



FIG. 132.—Gold *repoussé* chasing (A S).



FIG. 133.—Gold *repoussé* chasing (A S).

What is called *champ-levé* engraving, in which the ground is cut away leaving the design in relief, was often adopted for decorating English dials and inner cases from about 1650 to 1680. The watch by Edward East, Fig. 169, is an instance of this work. Many French watches and clocks of an earlier date were so embellished.

In the Nelthropp collection is a splendid watch by Thomas Windmills, the cases of which are engraved in an exceptional style, corresponding to the Italian niello work, where the effect of light and shade is produced by rubbing in a preparation of lead and silver. On the outer case is a view representing the yard of an inn with the sign of a pitcher. In the yard is being played the game of Pale Maille, popular in the time of Charles II., and from which the

thoroughfare of Pall Mall takes its name. Under the title of Croquet a very similar pastime was introduced in recent years.

Outer cases of silver embellished with *repoussé* chasing are shown below. Fig. 134A is an exceptionally late and fine specimen covering a watch by Jas. Murray, London; it has an oval pendant and the date mark corresponding to 1810. On the outside of the inner case is engraved "Francisco Joseph, 1811."



FIG. 134.—Half-quarter English repeater with silver out-case, *repoussé*, about 1740 (A S).



FIG. 134A.—Silver out-case of watch by J. Murray, hall mark 1810 (A S).

The watch shown in Fig. 159 has an outer case of steel, damascened, and Fig. 135 represents a steel out-case of a watch by "Flower, London," decorated with engraving; such cases are, however, quite exceptional. The dial of this watch is also of steel, blued and having gilt figures.

As a curiosity may be mentioned an outer case of carnelian which is to be seen in the British Museum. It belongs to a watch made by Strigner for James II., and by him given to his daughter, Catherine, Countess of Anglesey and Duchess of Buckingham, about

1687. Fig. 136 shows a watch by Cabrier which is furnished with an outer case of gold, carnelian and mother-of-pearl. Mr. George Carr Glyn, at the Guelph Exhibition, showed a watch by Jas. Hubert which had an agate case studded with diamonds.

Outer cases of horn and of tortoiseshell, either plain or *piqué* (Figs. 137, 138), were not uncommon, and the semi-transparency of these materials was sometimes utilized for a superior kind of decoration. A thin disc of tortoiseshell having been moulded to the metal foundation, a landscape or other design was either etched or



FIG. 135.—Watch by "Flower, London," with out-case of steel (A S).



FIG. 136.—Watch by C. Cabrier, with outer case of carnelian and mother-of-pearl set in gold (A S).

painted on the under side and a row of pins inserted around the edge of the tortoiseshell to secure it to the metal. The picture could be clearly seen through the tortoiseshell and appeared to be covered with a kind of glaze. Strong and inexpensive outer cases of metal, covered with some kind of skin, were also made. Among these coverings shagreen was perhaps the most popular. The true shagreen is a remarkable tough kind of leather, made chiefly at Astrachan from the strong skin that covers the crupper of the ass or horse. In its preparation a peculiar roughness is produced by treading into the skin hard round seeds, which are shaken out when



FIG. 137.—Tortoiseshell with silver overlay (A S).



FIG. 138.—Tortoiseshell with silver overlay (A S).



FIG. 139.—Leather covered out-case studded with silver pins (A S).



FIG. 140.—Clock-watch by Abraham Beckner, Pope's Head Alley, with finely pierced inner-case, about 1670 (A S).

the skin has been dried ; it is then stained green with copper filings and sal-ammoniac, and the grains or warts are then rubbed down to a level with the rest of the surface, which thus presents the appearance of white dots on a green ground.

The skin of the shark and of various other fishes, when properly prepared, formed an excellent covering, being thin and durable. This if dyed green was also known as shagreen. It was left with a slightly matted face, whereas the true shagreen bore a high polish.

The *piqué* surface on outer cases of leather or shagreen obtained by pins, usually of silver, passing through the covering and the inner metal case, had a good effect and afforded considerable scope for the skill of the producer, see Fig. 139. Besides an ornamental border there was usually a central design which in some instances embodied the crest or initials of the owner. These outer cases had of course to be removed when the watches were wound, and many of them left in coaches and other places, were advertised for in the *London Gazette* during the latter part of the seventeenth and beginning of the eighteenth centuries. Where considerable cost had been lavished on the decoration of the removable case, covering the box or watch case proper, a third case would be provided to protect the second one.



FIG. 141.—Pierced case of clock-watch (A S).

In some instances two second cases would be fitted to the "box" or inner case. A leather or tortoiseshell one for everyday use, and a more elaborate and costly one to be worn on gala days or other special occasions, when the watch, hanging from a chatelaine, could be displayed on the person.

As both the box and the loose case of striking watches and repeaters were pierced to emit the sound (see Figs. 140 and 141), something further was required to prevent the ingress of dirt or other obstructive matter, and a thin metal cap to cover the movement was invented almost contemporaneously with repeating watches. These caps were sometimes of silver but more generally of brass ; they

performed their office of keeping dust and dirt from the movement very efficiently, and have remained a feature of the English full plate watch to this day.

"Bull's eye," also known as "Ram's eye," cases, introduced about 1780, were the last variety of pair cased watches; they derived their titles from the form of the bezel of the outer metal case, which from the groove to the outer edge followed the curve of the glass. In many of the later "Bull's eyes" the usual round form of pendant was abandoned in favour of a broad flattened-oval shape which was much stronger. A good example on a case decorated with Prince of Wales' plumes, etc., in gold of various colours, is given in Fig. 142, which represents a watch made by James McCabe and bearing the hall mark of 1811.



FIG. 142.—Back of watch by Jas. McCabe, decorated with gold of various tints (A S).

After the introduction of pair cases it gradually became the custom to insert in the outer case a thin pad consisting of a circular piece of velvet, muslin, or other material, adorned with fancy needlework, a favourite form being a piece of white cambric having the initials of the owner as well as a fancy border worked in gold thread, or hair; in the latter case hair from the head of the fair artist would presumably be used for the purpose. The following lines were

very neatly executed in needlework on a silk pad in a watch dating from 1780 :—

" Take this token which I give thee,
It is one from friendship's shrine,
Place it where thou'lt think upon me,
When it meets those eyes of thine—
FORGET ME NOT."

"Watch papers" formed an alternative pad. Some of these were cut to geometrical designs more or less intricate and covering the whole surface or leaving a central space either circular or oval on which a miniature or sketch could be painted. Papers of this kind had a backing of bright coloured silk or satin to give the best effect

to the perforations. Some time ago I saw in a watch by Isaac Alexander, Nottingham, a paper, in the centre of which was an excellent coloured portrait of Charles Stuart and the following rhyme arranged in a circle round it:—

“O’er this loved form
Let every British breast,
With conscious joy
Its gratitude attest,
And hail ye Prince
In whom ye nation’s blest.”

In very tiny characters was the signature “J. June,” and the date 1745. The paper had probably been transferred, for the watch dated from about 1760. Papers having printed thereon a likeness of the Duke of Cumberland were issued in 1746, and in 1821 a superior pad of white and pink satin bearing a portrait of Queen Caroline was produced and speedily became popular among admirers of the Royal Lady. Two examples from the Ponsonby collection giving really fair portraits of Queen Charlotte and Queen Victoria, the latter, when she ascended the throne, are illustrated in Fig. 143 and 145.

Papers printed on the frozen Thames during the prolonged frost of 1814 were a cheap novelty which commanded a ready sale. Most



FIG. 143.



FIG. 144.



FIG. 145.

commonly watch papers contained an advertisement of the watch-maker, and sometimes an equation of time table for comparing the watch with a sun-dial, as in Fig. 144; and occasionally admonitory or sentimental verses in addition.

"*Memento Mori*" formed the text of many rhymes; the following, often met with, may be taken as examples :—

"Onward perpetually moving,
These faithful hands are ever proving
How quick the hours fly by;
This monitory, pulse-like beating,
Is oftentimes, methinks, repeating,
'Swift! swift! the moments fly.'
Reader, be ready, for perhaps before
These hands have made one revolution more
Life's spring is snapped—you die!"

The next example was printed around the edge of a paper by John Herron, Cowpen Quay, Blyth :—

"Behold O mortal man,
How swift thy moments fly,
Thy Life is but a Span,
Prepare, Prepare to die."

Another from the Ponsonby collection is as follows :—

"Time is, thou hast, employ the portion small.
Time past is gone, thou can'st not it recall.
Time future is not, and may never be.
Time present is the only time for thee."

Another admonitory verse equally popular runs :—

"Time is—the present moment well employ;
Time was—is past—thou canst not it enjoy;
Time future—is not and may never be;
Time present—is the only time for thee."

The next I take from a watch paper by T. Humphreys, Barnard Castle :—

"Could but our tempers move like this machine,
Not urged by passion nor delayed by spleen.
And true to Nature's regulating power,
By virtuous acts distinguish every hour.
Then health and joy would follow as they ought
The laws of motion and the laws of thought.
Sweet health to pass the present moments o'er,
And everlasting joy when time shall be no more."

These lines appear on papers of many other makers. They are from the pen of "Dr." J. Byrom, and appeared in the *Scots Magazine* for October, 1747.

An apposite but more uncommon inscription for timekeepers is, *Tempus metitur omnia sed metior ipsum*; "Time measures all things, but I measure it."

The troublesome loose outer case gave place gradually to the more compact modern styles. A series of wavy curves cut into the material known as "Engine turning," which is said to have been introduced as a decoration for watch cases about 1770 by Francis Guerint of Geneva, was long in fashion. It has a good effect, does not readily show scratches, and will doubtless again return to favour.



FIG. 146. —Early engine-turned case
(A.S.).



FIG. 147 (A.S.).

The earliest specimens were cut very deep into the metal, leaving coarse "barleys," as the projections are called, and could only be applied to a considerable thickness of metal. Finer divisions with shallower cutting, applicable to lighter cases, speedily became the rule, and an early specimen of coarse cut engine turning is now rarely to be met with. The example shown in Fig. 146 is on a repeating watch by Terroux l'Aine, Geneva, and is very little later than 1770.

Dials.

With few exceptions the earliest clocks and watches had the hours marked with Roman numerals placed radially with the bottom of each numeral towards the centre of the dial, so that the V., VI., and VII. appear to be upside down. Another peculiarity is that the fourth hour was denoted in a very primitive way, thus: IIII., instead of by IV., which was then the more orthodox manner. And it is somewhat remarkable that these features have been continued to the present

day almost unnoticed, as may be proved by asking anyone to sketch the figuring of his watch without looking at the timekeeper, for in most instances such a sketch would be incorrect. But the fact is, we do not read the figures when looking at a watch or clock, but judge the time from the position of the hands. Lord Grimthorpe was instrumental in having the hours of the turret clock at the dining-hall of Lincoln's Inn marked each by a short thick radial stroke instead of figures, and it is rarely that passers-by notice anything unusual, except that the dial seems particularly clear.

For the dials of the earliest portable timekeepers the numerals were almost invariably engraved on a separate belt, which was



FIG. 148.—Small gold watch by T. Williamson, London; leather out-case with gold pins, gold dial, with raised numerals, one hand, about 1640 (A S).



FIG. 149.—Watch by Nathaniel Barrow, about 1660 (A S).

generally of silver, the inner ground of the dial being of brass gilt (or gold) and matted or engraved. (See Figs. 39, 57, and 115. A later example is given in Fig. 147.) Many early watches were furnished with a knob at each hour, in addition to the numeral, for the convenience of estimating the position of the hand by feeling, as shown in Figs. 39 and 115. The first noticeable departure from the original construction took place about 1620, when dials wholly of one metal were introduced. The hour numerals were very long, raised from the surface of the dial, and usually filled with wax, as in Fig. 148. A little later the centre of the dial was formed of a separate disc chased and engraved. Silver dials with short numerals not embossed, and with landscapes and other views

engraved on the centre, also came into favour nearly at the same time. These dials were recessed into what is now called a "brass edge," that is, a ring independent of the plate of the movement, and to which the dial, was attached. The dial was rather smaller than the movement, and a narrow margin of the brass edge, which appeared outside of the dial, was engraved, the contrast of the silver and brass having a good effect. A fine example by Nathaniel Barrow is shown in Fig. 149. The watch by Edward East, said to have been given by Charles I. to Mr. Herbert, and engraved on p. 168, had a very similar dial.

About the middle of the seventeenth century, dials painted in enamel became the fashion for the most costly watches, and shortly afterwards gold and silver dials with the figures in relief came into general use.

An exceptional and somewhat grotesque treatment of the dial is shown in Fig. 150, representing a watch made about 1665 by Richard Jarrett, who was Master of the Clockmakers' Company in 1685. The centre of the dial is of brass matted, and the ring, on the inner edge of which is engraved quarter hour spaces, of silver finely matted, with polished plaques for the hour numerals.

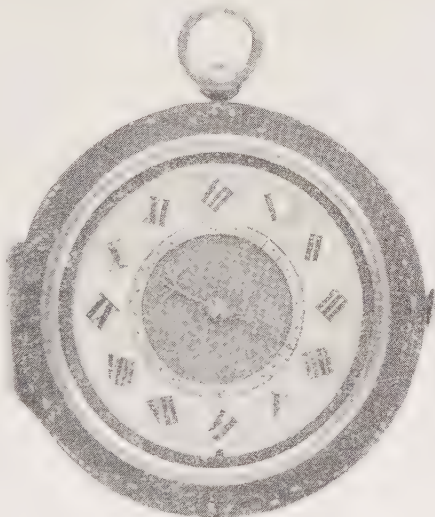


FIG. 150 (A S).

With the introduction of the minute hand, the hour numerals were shortened, and outside of them were the minute circle and the figures to indicate each five minutes. The hour numerals were sometimes polished, but more usually the outline was polished and the body filled in with wax; a small diamond between each one was polished, and the minute figures were engraved on polished plaques. In some of the earliest of these dials half-hour spaces were marked on a circle within the hour numerals. The separate central disc recessed into the brass edge was as a rule nicely chased and engraved. It usually bore two tablets for the name of the maker and the place of origin of the watch. An excellent example

is the watch by Langley Bradley, shown in Fig. 208. In 1729, engravers petitioned the Clockmakers' Company to debar one Griliat from proceeding with a project he had for producing dial plates by stamping. Nevertheless, many later ones were embossed in this way. Plain enamelled dials seem to have been introduced about 1680. Though watches made prior to 1680 are occasionally to be met with having dials of white enamel, it will generally be found that they are subsequent applications, the original dials having probably been discarded owing to the superior legibility of the white enamelled discs.

Many French and Swiss watches made towards the end of the seventeenth and at the beginning of the eighteenth centuries had the hour numerals on enamelled plaques, though they do not seem to have been favoured here. A dial of this sort is on the alarm watch shown in Fig. 151, made about 1680 by Dumont Frères, Besançon. The body of the dial is of brass gilt. Watches of this class were very thick, and had cases of brass gilt and engraved to a fine pattern.

Many watches made for the Dutch market during the eighteenth century were fitted with silver dials having raised numerals filled with wax, and ornamental centres of various designs engraved and pierced. Occasionally a figure of Time was introduced, the Destroyer being represented with a flag in his hand, on which the name of the maker was engraved.

A dial with the centre *à jour*, from the Schloss collection, is shown in Fig. 152. But dials with perforated centres required a lining at the back to exclude dirt, and they found but little favour among English patrons.

Dials with the minute band formed in a series of wavy curves were made during the eighteenth century, chiefly by Dutch watch-makers or on watches intended for the Dutch market. An early example on a watch by John Van Ceulen of the Hague, and dating from about 1700, is shown in Fig. 153.

Dials of metal, with polished hour numerals of a different tint soldered on, introduced during the latter part of the eighteenth century, were for some time popular; a specimen of this style, on a watch by James McCabe, is shown in Fig. 154. But though considerable skill has been expended in the enrichment of metal dials by chasing and engraving, as well as by variations of colour, enamel has practically ousted all other materials, except for scientific purposes, where extreme accuracy of division is desired.

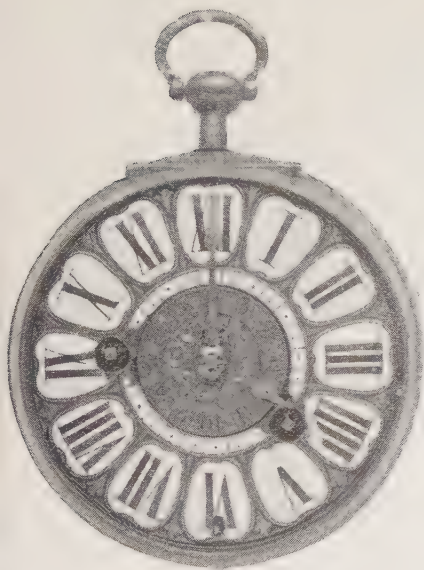


FIG. 151 (A S).



FIG. 153 (A S).



FIG. 152 (A S).



FIG. 154.—Watch by Jas. McCabe (A S)

In modern dials the hour numerals are too long, the position of the hands being more easily discerned with the stumpy figures used in the earliest timekeepers. The fact is, the dialmaker has been allowed to regard his work without reference to the hands, and he has adopted a rule to make the "chapters" in length equal to two-and-a-half minutes of the circle, because they are more obtrusive than the shorter ones previously used. The most effective hands were those seen in clocks and watches of the latter part of the eighteenth century. The chief fault of most varieties now used is that the spade or heart or other enlargement of the hour hand is too close to and overlaps the numerals. It should be of good size

and nearer the root of the hand, the tip of which, though closely approaching, should in its sweep just clear the numerals.

People who are used to reading a dial with but one indicator can estimate the time with astonishing closeness, and it is pretty certain the two hands did not meet with general favour for a long period. Although we are, from long practice, able to instantly note the minute and hour from the position of the two indicators, it is an acquirement. Children and other tyros seem to go through a slower process by separating the functions of

the two and deciding upon the position of each singly. In fact, there can be no doubt that it is at first difficult to decipher the double indication together. Many devices were tried during the latter part of the seventeenth century to give the accuracy of the separate minute circle without the confusion of two similar hands. Of these may be mentioned dials with revolving centres, having a finger to point to the hours. In another plan representations of the sun and moon were utilized for the purpose. Sometimes figures corresponding to the current hour were shown through an aperture in the dial, and warriors with swords as pointers are among the most familiar of other varieties.

Fig. 155 represents a watch by Tompion, from the collection of



FIG. 155.—Curious Tompion watch (A S).

Mr. Schloss. It is in an enamelled case and dates from about 1705. Though the concentric minute hand was introduced certainly thirty years before this date, the specimen here shown has only one hand; but the chief peculiarity in connection with the dial is its division into six hours.

Here the idea is evidently to give with one hand a longer space than usual for more nearly estimating small fractions of an hour. Quare adopted the same method, as will be seen from the following advertisement, quoted from the *London Gazette* for March 25-29, 1686: "Lost, on 2nd inst., a Silver Pendulum Watch, the name Daniel Quare, London; it had but six hours upon the dial-plate, with six small cipher figures within every hour, the hand going round every six hours, which shows also the minutes between every hour. Whoever gives notice of it to Daniel Quare, at the King's Arms, in Exchange Alley, London, shall have a guinea reward."

Early Minute-hand Watches.

Fig. 156 shows a watch dating from about 1665 which is a particularly interesting specimen, and affords evidence that the maker of it was far in advance of his

time. It shows hours, minutes, and seconds, and has a long train containing the same number of wheels and pinions as modern watches, the minute hand being attached to the centre pinion. The dial is of silver, and the middle portion of it driven by a pinion on the great wheel arbor, revolves once in twelve hours, a figure of Time engraved thereon pointing to the hour; the seconds dial is a silver plate on the back of the movement, the seconds hand being carried by the contrate wheel, which rotates once in a minute. On the plate is engraved "John Fitter, Battersea." There is no balance-spring. It has a nicely pierced and engraved silver balance-cock and arched top harp pillars. The potence is



FIG. 156 (A S).

peculiar, being carried by a pivot into the top plate ; the side view of it is very wide, nicely pierced, and engraved to a floral design.

On the back of the inner case is engraved a kind of calendar remembrance as shown below. It appears to be a key for finding

<i>Mar</i>	<i>Nov</i>	1	8	15	22	29
<i>Augus</i>		2	9	16	23	30
<i>May</i>	<i>Jan</i>	3	10	17	24	31
<i>Octob</i>		4	11	18	25	+
<i>Apr</i>	<i>Jul</i>	5	12	19	26	+
<i>Sep</i>	<i>Dec</i>	6	13	20	27	+
<i>Jun</i>	<i>Feb</i>	7	14	21	28	+



FIG. 157 (A S).



FIG. 158.—Seventeenth century watch key (A S).

at a glance the days of the months upon which any particular day of the week will fall.

The outer case, covered with leather *piqué* with silver pins, is snapped together without a bolt—a most unusual construction.

This watch was formerly in the Roskell collection.

On a watch by David Lestourgeon, shown in Fig. 157, there are two narrow rotating rings between the centre of the dial and the hour numerals; one of these carries a very short and the other a longer pointer, the former for indicating the hour and the latter for the minutes.

The handsome key for this watch is shown in Fig. 158. For winding or setting the hands it is used as a crank; the squared extremity at the bottom is for altering the regulator, which may be done without opening the inner case, an aperture being made in the back of the case for the purpose.

Sun and Moon Hour Indicators.

Two examples of a peculiar method of indicating the hour which obtained some popularity at the end of the seventeenth century, are shown in Figs. 159 and 160. A semicircular piece is removed from the upper part of the dial, and through it is seen one half of a disc which rotates underneath once in twenty-four



FIG. 159 (A.S.).



FIG. 160 (A.S.).

hours. On one half of the disc is engraved the sun, which points to the hour from 6 a.m. to 6 p.m., and on the other the moon, which performs the same office from 6 p.m. to 6 a.m. The minutes are indicated in the usual way by a hand travelling round the dial in an hour.

Fig. 159 is an early specimen. On the lower portion of the dial is an engraving, possibly representing Saturn dragging the car of Helios. The movement is furnished with tulip pillars, and on the plate is engraved "Jo Holoway, Newbery." The balance-cock is of floral design with a narrow waist and foot of irregular outline following the curve of the plate. The outer case is of steel damascened with silver.

Fig. 160, of a slightly later date, is inscribed "Harns Smit, Amsterdam"

**Changing
Hour
Figures.**

In this ingenious contrivance of the old masters, hands are dispensed with altogether, and numerals corresponding to the last completed hour caused to appear through a hole in the dial, a principle favoured in recent years by several inventors, who have devised various means of accomplishing this end. In Fig. 161 is shown a



FIG. 161.

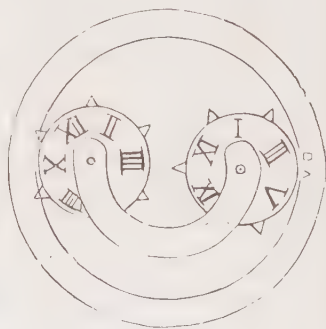


FIG. 162.

watch by M. Lögg of Vienna, from the Marfels collection. It has an upper silver dial on which is chased a group, said to be a representation of Saturn dragging the car of Helios. As may be seen by the illustration, there is above the group on the silver dial a semicircular slit, through which is visible a second dial lying under

it. This second dial is gilt, for contrast. Above the opening of the silver dial are engraved the minutes from 1 to 60, and underneath it the quarter-hours I. to IV. The lower dial is movable, revolving once in two hours, and has two circular openings exactly opposite each other, through which the hour chapters appear upon a silver disc. A pin is fixed upon and near the edge of the front plate, over which the dial revolves. The dial passes freely by it, while the projecting teeth of the two numeral wheels in turn meet the pin, and are each time advanced one hour (see Fig. 162). Suppose, in the opening under which is located the disc with the even figures, we



FIG. 163.

see the number II., as in Fig. 161. This number has entered from the left into the semi-circular slit of the silver dial, through which it slowly passes in one hour, while the other numeral wheel (which is during the same time under the Saturn group, and therefore invisible), with the odd figures, passes by the stationary pin, and is by it turned one tooth, or from I. to III. When the number II. has passed its course through the semicircle it disappears to the right under the Saturn group, and the number III. enters from the left into the semicircle, in order to pass through its course in the same manner. The disc with the hour II. meanwhile keeps on its way invisibly, passes

the stationary pin, and is also turned one tooth further on, so that at the next hour it enters again with the number IV. from the left into the semicircle of the silver dial. This procedure is repeated with all the succeeding numerals. The number of minutes which have elapsed since the last completed hour is indicated by the position of the revolving hour chapter with relation to the figures which are engraved on the fixed dial plate.

Fig. 163 shows another watch of this character, taken from the catalogue of the Geneva Exhibition, 1896. It is by Paul Lullin, and most probably French. In the lower portion of the fixed dial is an enamelled medallion, with portrait, said to be that of Louis XIV. when a youth.

Mr. Henry Levy has one of these curiosities by Fromanteel, which may be either English or Dutch. On the lower part of the fixed dial is a late seventeenth century design, with birds, etc. A peculiarity of this watch is that the fusee may be turned either way to wind it, a device advertised by Thomas Moore of Ipswich, in 1729, and illustrated by Thiout in 1741.

**"Fencing
Soldiers' "
Watch.**

Figs. 164 and 165 show a watch of very peculiar construction from the Marfels collection, which was made during the last century. The metal dial plate has a blue enamelled ground, with thin white lines, and upon it are fastened two quadrants. The hours from I. to XII. are marked upon one, and upon the other the minutes from 1 to 60. It also bears two chased figures of soldiers in a fencing attitude, one on each side of the quadrants. By pressing upon the pendant, the soldiers draw their swords, the one to the left pointing with his sword to the hour, while the one to the right points to the minute upon their respective quadrants. The construction is shown in Fig. 165, which is the movement without the dial. Upon the arbor of the wheel, which is usually in the centre, is the cannon *a*, upon which is fixed the snail used for determining the minutes. The cannon drives in the ordinary manner a minute wheel, the pinion of which depths in a wheel located to one side, which it rotates once in twelve hours. Upon the latter wheel is fastened a snail for determining the hour. When the pendant is pressed down, the two levers *b b* are first unlocked, which unlocking actuates the four racks *c c* and *e e*, each two of which depth together into pinions *f f*. Upon the arbors of the two pinions *f f* are placed the arms of the soldiers. By the unlocking of the levers *b b*, the

racks *ee* (situated above the centre of the plate), freed from the arm *dd*, are then moved upward by springs operating on them. The pinions *ff*, into which the racks *depth*, turn an appropriate distance, and with them the arms of the soldiers, which are located on the pinions, and thereby carry with them downward at the same time the lower stationary racks *cc*. These racks *cc* are provided with projections, which in their downward motion finally strike upon the



FIG. 164.



FIG. 165.

snails, the one to the left lying upon the hour rack, and that to the right upon the minute rack. When the pressure upon the pendant is removed, all the parts of the motion work, and with them also the arms of the soldiers, are by a spring brought back into a position of rest. The cannon pinion *a*, fitting with gentle friction upon the centre wheel arbor, is provided with a setting square passing through the dial, for the purpose of setting the motion work mechanism.

Pendulum Watches.

A curious fancy which obtained some popularity at the end of the seventeenth and beginning of the eighteenth centuries, is shown in Fig. 166. The balance was placed under the dial and its arms weighted. A semi-circular slit in the dial allowed one weight of the balance to be seen, and this as it vibrated somewhat resembled



FIG. 166 (A S).

Musical Watches

of large size
with moving
figures were
a favourite

conceit among French makers during the latter part of the eighteenth century. The appended example (Fig. 167) is from the collection of Mr. James Usher, of Lincoln. It is mounted on both sides with fine pearls and chased gold. The back is enamelled with a landscape in colours; in the foreground is a pavilion (supposed to represent the one at Versailles) and figures, in gold of different colours: inside are small figures (couples of lady and gentleman) in the dress of the Louis Seize period, which dance when the movement is wound. The lady seated outside the pavilion plays the harp, and the gentleman seated opposite beats time with his *bâton*.

a pendulum in motion. It was, however, an inconvenient arrangement, by reason of the difficulty of getting at the balance for regulation, and it appears to have been abandoned in favour of a pendulum balance at the back of the watch. The watch here illustrated is by "Mitzell, London," and dates from about 1700.



FIG. 167.—Musical watch with moving figures.

Inside the pavilion are walls of burnished steel, which reflect and multiply the dancing figures in a remarkable manner. The escapement is a cylinder one with brass scape wheel. The going part is driven direct from the barrel. The musical box and figures are driven by one mainspring, the train passing beneath the pavilion and revolving the centre of the floor upon which the dancers stand ; smaller wheels being employed to revolve each pair of dancers three times for every one dance round the room ; the conductor and harpist being worked by pins and levers between the plate and the dial.



FIG. 168 (A S).



FIG. 169 (A S).

Fig. 168 is a repeating watch of French make. The hours and quarters are really struck on gongs curled around the inside of the case in the usual way, but, when the pendant is pushed in to repeat, the hammermen in the recess at the upper part of the dial appear to strike on the bells shown there, and the woman below works a spinning-wheel.

Another arrangement of moving figures is shown in Fig. 169. Here the sails of the windmill are constantly moving while the watch is going, and seen through the round aperture is part of a rotating disc with figures of horses and men painted thereon.



FIG. 170 (A S.).



FIG. 171 (A S.).

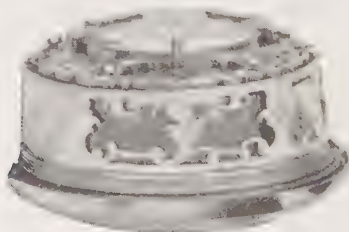


FIG. 171A (A S.).



FIG. 171B (A S.).



FIG. 172 (A S.).

privilege to examine is shown in Figs. 171, 171A and 171B. It is by Samuel Ruel, Rotterdam, and stamps him as a horologist of the first rank. Besides the age and phases of the moon and the title of the month, it shows through apertures over the XI. and I. the day of the month according to the old style and the new style. The cases bear the English hall mark of 1788 with the duty head; on the back of the inner case is "A.S." arranged as a monogram. The outer case has a diamond thumb piece. There is a rim cap (as seen in Fig. 171A) of silver, having perforations covered with horn. The cock, as seen in Fig. 171B, is a fine piece of chased work.

A souvenir watch, such as is shown in Fig. 172, was deserving of more popularity than it seemed

The astronomical watch shown in Fig. 170 is by Willing, London, and dates from about 1690. The dial is really excellent; the engraving shows it was prepared for use in Germany. Such a watch at that period would doubtless be made to order for presentation to some person of distinction.

One of the finest calendar watches of late eighteenth century production it has been my

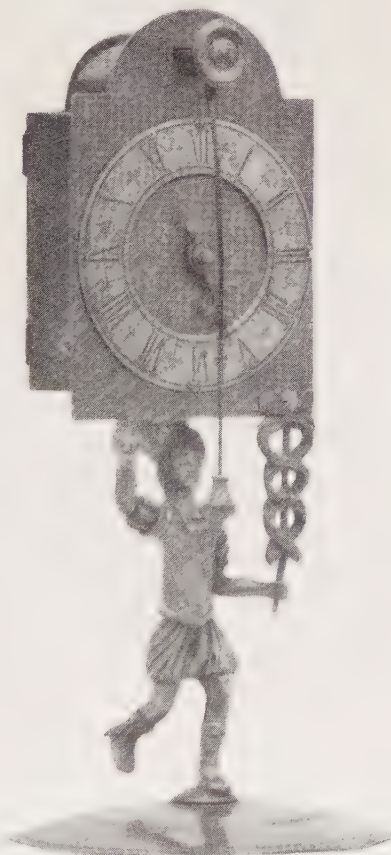


FIG. 173 (A S.).

to have attained. The surface enclosed by the large circle was reserved for inscriptions, monograms or other personal references. Underneath is the mechanism of the watch, whose motion is conveyed to the hands by means of a small rod concealed in the connecting neck. On the movement is engraved, "Inventio Johannis Holtmann in Wienns No. 25." This specimen, which belongs to Mr. Schloss, dates from about 1780.

A curious little clock, supported by a winged Mercury, and arranged for the pendulum to swing in front of the dial, is shown in Fig. 173. It is of English make, bearing the inscription, "Chasseur, London." Altogether it is six inches in height. Around the arch of the dial is engraved,—

"CITO PERVNT ET IMPVTANTVR"

(They pass quickly and are reckoned).

RECORDS OF EARLY MAKERS.

Bartholomew Newsam was one of the earliest English makers of portable clocks whose work survives. It is conjectured he was a Yorkshireman, but he must have attained some position in London before 1568, for in that year he secured a 30 years' crown lease of premises in the Strand, near Somerset House, where he resided till his death. In the British Museum is a very fine example of his skill, which proves Newsam to have been a master of the craft. This is a striking clock, in a case of brass, gilt and engraved, about $2\frac{1}{2}$ inches square and 4 inches high, exclusive of an ornamental domed and perforated top, which brings the total height to $6\frac{1}{2}$ inches. The centre of the dial as far as the hour ring is below the surface of the case, so that on removing the base, the movement, together with the centre of the dial and hand, may be drawn out. The hours are engraved on a broad bevelled ring, which extends from the sunk part of the dial to beyond the front of the case. An exterior view of Newsam's clock is appended (Fig. 174). The movement is arranged in stories, there being three plates held in position by four corner posts. Above the top plate is a semi-circular bell; between the upper and middle plate is the going train, and between the middle and lower plate the striking train, the locking plate occupying a position below the lowest plate. The arbors are placed vertically, and the winding holes are at the bottom of the case. The wheels are of

steel or iron, the fusees very long, and with but little curve in their contour; they are connected with the barrels by means of catgut. The plates, posts, and barrels are of brass, the barrel covers of iron held in by a number of tenons around the edge. The hand is driven from the fusee of the going part by a contrate wheel. The escapement is, of course, the verge. The workmanship, unusually fine for the period, is remarkably free from subsequent interference. There is a very small hinged door on each side of the case, giving, when open, a view of the fusees. No screws are used in the construction of the movement, which is inscribed "Bartilmewe Newsum." In vol. lv. of *Archæologia* is illustrated a fine casket by Bartholomew Newsam.

In the "Calendar of State Papers" of the time of Queen Elizabeth is a record of a grant in 1572 to B. N. (who no doubt was Bartholomew Newsam), of the office of the clockmaker to the queen in reversion after the death or surrender of N. U. (probably Nicholas Urseau). In the same calendar is a letter dated August 5th, 1583, from Bartilmew Newsham to Sir Francis Walsyngham. This letter probably refers to a renewal of Newsam's lease, and it desires Sir Francis to favour the writer's petition to her majesty for the augmenting a certain term of years, wherein he had moved Sir Philip Sydney to speak to him. He was clock-keeper to the queen prior to 1582, and on June 4th, 1583, under Privy Seal was paid 32s. 8d. for "mending of clocks during the past year." Under date 1590 is a grant to Bartholomew Newsham of the office of clock-maker to the queen, in place of Nicholas Urseau, deceased. Newsam appears then to have combined the offices of clock-keeper and clock-maker which had previously been kept distinct.

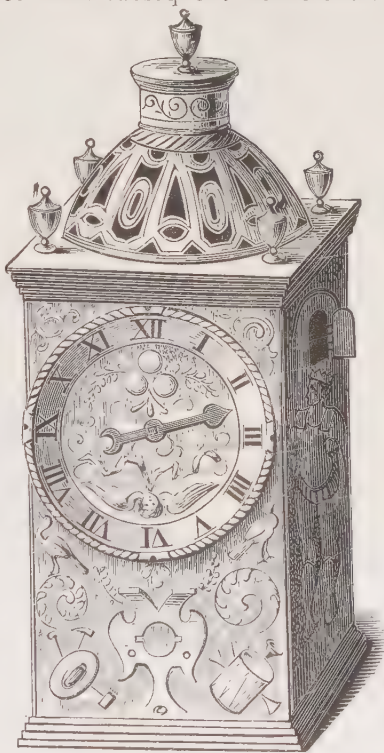


FIG. 174.—Clock by Bartholomew Newsam.

His tenure of the double appointment was a brief one, for he died in 1593. By his will, dated in 1586, he bequeathed to his apprentice his "seconde clocke"; to John Newsam, clockmaker of York, his "best vice save one, a beckhorne to stand upon borde, a great fore hammer, and to (two) hand hammers, a grete longe beckhorne in my backe shoppe; and all the rest of my tooles I give unto Edward Newsom, my sonne, with condicion that he become a clockmaker as I am, yf not I will the foresaid tooles to be sould by my executors." He gave to a friend "a sonne dyall of copper gylte"; to another "one cristall jewell with a watche in it, garnished with gould"; to another, "one watch clocke, in a silken purse, and a sonne dyall to stande uppon a post in his garden"; and to another, "a chamber clocke of fyve markes price."

Bull.

Rainulph or Randolph Bull appears to have been an English horologist of some note. In the British Museum is a rather large oval watch by him, dated 1590. It has on a shield the arms of the owner and his name, "W. Rowley." Bull was also keeper of the Westminster great clock. In Devon's *Issues of the Exchequer* there is an entry under date 1617, 1st of April: "By Order, dated 29th March, 1617. To Ranulph Bull, keeper of his Majesty's great clock, in his Majesty's palace of Westminster, the sum of £56 13s. 4d., in full satisfaction and discharge of and for divers sums by him disbursed for mending the said clock, in taking the same and other quarter clocks all in pieces, and repairing the same in the wheels, pulleys, hammers, weights, and in all other parts, and in new hanging, wiring, and cordings of the same clock, and other necessary reparations thereunto belonging, the charge whereof, with his own workmanship and travail therein, doth amount to the sum aforesaid, appearing by a note of the particular demands, delivered upon his oath, taken before one of the Barons of his Majesty's Exchequer, without account or imprest to be made thereof. By writ dated 27th of March, 1617, £56 13s. 4d."

In an account of the household expenses of Prince Henry, in 1610, "Emanuel" Bull, the "clocke-keeper," is mentioned.

At the South Kensington Museum are two watches inscribed "Edmund Bull in Fleet Streete fecit"; one is in an oval case of brass and silver and the other in an octagonal case; both are early seventeenth century productions.

Garret. Among other watches which Octavius Morgan exhibited to the Archæological Society in 1840 was an early English one in the form of a Tudor rose. The dial he described as elegantly engraved and gilt, with an hour circle of silver. There was no ornament on the balance cock and the movement was imperfect. The watch was made about 1600 by Ferdinando Garret. In the British Museum is an oval watch by the same maker in a case of metal gilt, period about 1600. Another watch by him is mentioned in the *London Gazette* for March 29th-April 1st, 1680, as follows: "A small eight square Watch, the edges Brass, and the Cover and Bottom silver, made by Ferdinando Gareet."

Grinkin. Appended is a view of an early English alarum and striking watch by Robert Grinkin, London, for which I am indebted to Mr. Percy Webster of Great Portland Street. The case is of brass nicely pierced; the dial, also of brass, is finely engraved as shown, the hour hand being of polished



FIG. 175.—Watch by Robert Grinkin.

silver. There are no screws in the movement and the watch dates from about 1600. In the British Museum is a very small oval watch by the same maker of the same period, but beyond the specimens of his work which remain, no particulars of him appear to be obtainable.

In Devon's *Issues of the Exchequer*, under date 1605, **Henche.** 10th of October, occurs the entry, "By Order the last of September 1605, to Uldrich Henche, clockmaker, or to his assignee, the sum of 100*l.* for a clock in manner of a branch made by him and set up in his Highness's at Whitehall." And under date 1607, 5th of July, another entry runs—

Flood. "To Humphrey Flood, goldsmith, or his assigns, the sum of £120, in full satisfaction and payment for a clock covered with gold, and set with diamonds and rubies and by him delivered to his Majesty's use, at the price of £220, whereof received £100."

North. As an example of oval astronomical watches of English make, such as were popular in the early part of the seventeenth century, may be taken one in the British Museum, inscribed "William North, Londini," and of which an exterior view is given in the subjoined engraving. It shows



FIG. 176.—Watch by William North, London, about 1615.

the hours on the lower and day of the month on the upper circular band. There are, in addition, four apertures in the dial. Through the largest of these, on the left, are shown the days of the week, with the corresponding allegorical figures: Apollo for Sunday, Diana for Monday, Mars for Tuesday, Mercury for Wednesday, Jupiter for Thursday, Venus for Friday, and Saturn for Saturday. Through the three openings on the right are seen the phases of the moon, the quarters of the moon, and its age in days. These three subjects are all engraved on one circular plate below. Symbols representing six planets appear in rotation below the small square on the right, just outside and lower than the centre of the hour ring.

It may with tolerable certainty be affirmed that the movement of this watch was made about 1615, although the case is probably of a later date. William North was admitted as a brother of the Clockmakers' Company in 1639, and the fact of his being noted as a brother would indicate that he had then been established for some time, and was free of another company.

Crayle. In the South Kensington Museum is a particularly diminutive watch in a plain oval case, which measures outside but half an inch in length and three-eighths of an inch across, by Richard Crayle, London, and said to have belonged to Lord Hussey, who was beheaded in 1536. I am not aware what evidence exists to warrant this statement, but 1536 is rather an early date for a watch of this character to be in existence, and I should be inclined to think it was the production of the Richard Crayle, who was a member of the Blacksmiths' Company before the existence of the Clockmakers' Company, and who signed the petition for its incorporation. In the British Museum is a round watch movement by Richard Crayle, Fleet Street, a production of about 1620. William Crayle, who in 1676 carried on business in Fleet Street, and afterwards at the Black Boy in the Strand, near the Savoy, was probably a descendant of Richard.

Alcock. Mr. Edward Parr has a very fine circular calendar watch by Thomas Alcock, as shown in Fig. 177. The dial is really superb ; it indicates the age and phases

of the moon by means of the central rotating disc, and the day of the month by a rotating ring outside the hour circle. The movement is very well made and in good order, it dates from about 1635. The case is of brass, curiously engraved, and though old, of later date than the movement. Thomas Alcock was one of the petitioners of the incorporation of the Clockmakers' Company in 1630. In *Kingdom's Intelligencer*, February 4th, 1661, was advertised as lost "a round high watch of a reasonable size showing the day of the month, age of the moon, and tides ; upon the upper plate Thomas Alcock fecit."



FIG. 177.

tides ; upon the upper plate Thomas Alcock fecit."

**David
Ramsay.**

One of the earliest British watchmakers of particular renown was David Ramsay.

Among the Salting collection at South Kensington Museum is a very early watch by him in a small irregular octagonal case of gold and silver. It has hinged covers over the front and the back, and is decorated with engravings of the Annunciation and the Nativity.

In the British Museum is an oval watch of his make, with a gold case in the French style. The period assigned to this watch is 1600 to 1610. It is inscribed, "David Ramsay, *Scotus*, me fecit."

There is an entry in the account of money expended by Sir David Murray, Kt., keeper of the privy purse to Henry Prince of Wales, who died in 1612. "Watches three bought of Mr. Ramsay the Clockmaker lxj li" (£61). In the same account, among the list of "Guyftes and Rewardes," is the item, "Mr. Ramsay the clockmaker xjs [11s]."

An oval calendar watch, showing the age of the moon, which is supposed to have belonged to James I., is described in the *Archæological Journal*, vol. vi. p. 415. It had a plain outer case of silver, the inner one being beautifully engraved; on one side was represented Christ healing a cripple, also the motto used by James, "Beati pacifici," and on the other side the Good Samaritan with the inscription, "S. Lucas c. 10." Inside the cover was a well-executed engraving of James, with his style and titles. Under a small shield which concealed the hole for winding was the name of the engraver, "Gerhart de Heck." Around the edge of the case were the Rose, Harp, and Thistle and the initials J.R. On the plate of the watch was engraved, as before, "David Ramsay, *Scotus*, me fecit," and these inscriptions, together with the fact that he had a grant of denization in 1619, prove that he was a native of Scotland.

Mr. J. Sanicroft Holmes had another watch by Ramsay, which was found seventy or eighty years ago behind the tapestry which then covered the wall of the dining-room of Gawdy Hall. With the watch were two apostle spoons and papers relating to the troublous times of Cromwell. The case of the watch is of silver and shaped like a star or heraldic mullet of six points.

The engravings on page 68 show a splendid clock-watch with alarum by him, from the collection of Mr. Evan Roberts, dating from about 1615. It has the three wheel train usual in early watches, and Mr. Crewe, in describing the movement, remarks that the fusee is cut for twelve turns, and the end of the great wheel

arbor, which goes through the pillar plate, is fashioned into six pegs or leaves, identical with a lantern pinion in its action. These leaves work in a wheel pivoted into the centre of the pillar plate, having sixty teeth, and carrying the single hand of the watch. Thus ten turns of the fusee are equivalent to an entire circuit of the hand on the dial, and so the watch would require to be wound twice a day. The stop work to the fusee is precisely the same as that used now in nearly all English watches with chains, and is almost the only part of a watch which has reached finality. The ratchet wheel, which sets up the mainspring, is on the top plate, and is identical in principle with that in ordinary use in English watches with fusees.



Front view.



View of edge and back.

FIG. 178.—Clock-watch and alarum by David Ramsay.

The stop for the alarum part is effected by a wheel and pinion, the wheel having a portion the size of two teeth left uncut, and which serves as a block to the pinion after it has been wound three turns. The wheels and pinions have a wonderfully smooth action, though they appear to be cut by hand rather roughly. The count or locking wheel of the striking portion is made of silver, and the notches have been certainly made with a file. The alarum part has a verge escapement with counter and crown wheels. Attached to its verge is a V-shaped piece of brass with an arm, and this pressed by a spring drops into a notch made in the edge of a brass disc on the hand or hour wheel, and so liberates the verge and lets off the

alarum. Between this disc and the hour wheel, and working concentrically with them, is a star wheel having twelve teeth, which by lifting up a brass arm connected with the count wheel causes it to strike. The potence is a rather slender piece of square brass, and is riveted to the top plate, and the banking is made by steps cut in it. These riveted potences are found in nearly all watches made before 1700. The balance cock is a slender piece of work, and is pierced throughout, and the neck very narrow, so different from specimens of Tompion and other later masters. The case is very elegant in design, and is pierced in the back and band, the bezel being engraved, and in every respect it will compare favourably with any work of the kind. Curiously enough, the band is silver, and bezel and back of bronze, and the whole case gilt. On the margin of the top plate, in tiny characters, as if almost to escape observation, is engraved, "David Ramsay inv^t Fecit," the *et* having been obliterated.

R. B. P., in the *Dictionary of National Biography*, says David Ramsay belonged to the Ramsays of Dalhousie, and quotes Ramsay's son William to the effect that "when James I. succeeded to the crown of England, he sent into France for my father who was there and made him page of the bedchamber, and keeper of his Majesty's clocks and watches." In 1613, James gave David Ramsay a pension of £200 per annum, and in the same year a further pension of £50 per annum. In the grant he is styled "Clockmaker Extraordinary." In 1616 a warrant was signed to pay him £234 10s. for the purchase and repair of clocks and watches for the king. On November 26th, 1618, he was appointed to the office of "Chief Clockmaker" to his Majesty, with fees and allowances for workmanship. On September 30th, 1622, he received £232 15s. for repairing clocks at Theobalds, Oatlands, and Westminster, and for making a chime of bells adjoining the clock at Theobalds.

In 1625 James I., his patron, died, but Ramsay appears to have retained his appointments, for on January 25th, 1626, a warrant to pay to David Ramsay £150 for coins to be given by the king, Charles I., on the day of his coronation, was signed. Again, "March 17th, 1627, is a warrant to David Ramsay, Page of the Bedchamber and Clockmaker, £441 3s. 4d. for work done for his late Majesty, and £358 16s. 8d. in lieu of diet and bouche of Court." In 1628, July 10th, a warrant was signed to pay him £415 for clocks and other necessities delivered for the king's service.

Among the State Papers *Dom.* 1653 are two receipts taken from

the Jewel House at Whitehall soon after the death of Charles I. The first is as follows, "18 die Feb. 1649. Recd. one clocke with divers mocons, two globes, one case for a clocke, and a glasse, one Bullet Clocke, one clocke with five bells, and one other clocke, all which were lying at Whitehall late in the charge of David Ramsay." The second is merely a subsidiary receipt of the same date for "one other clocke in a Bow received from Ramsay."

Sir Walter Scott introduces Ramsay as a character in "The Fortunes of Nigel," as the keeper of a shop a few yards to the eastward of Temple Bar, and in a note to that novel he is described as "Constructor of Horologes to His most Sacred Majesty James I."

That Ramsay was the most celebrated watchmaker of the day may be inferred from the fact that when the clockmakers obtained their charter of incorporation, he was therein appointed to the office of master. He does not appear to have taken a very active part in the management of the company. During his absence in the country, Mr. Henry Archer was appointed deputy master. William Ramsay dedicated "*Vox Stellarum*" to his father in 1652, and in a postscript dated 1653 remarks, "from my study in my father's house in Holborn, within two doors of the 'Wounded Hart,' near the King's Gate," and there David Ramsay probably died, though the date of his death is uncertain, but it probably occurred about 1654, and though his age is not stated he was then certainly very much past the meridian.

He is known to have been an inventor or schemer from the beginning of the century, and between 1618 and 1638 he took out no less than eight patents, none of which, however, seem to be connected with horology; they related to raising water, draining mines, making saltpetre, separating gold and silver from the base metals, smelting iron, constructing furnaces of various kinds, dyeing fabrics, etc.

He was a friend of James Lilly the astrologer, who, in his autobiography, relates that he accompanied Ramsay to Westminster at night to make some experiments with a view to discover treasure by means of the divining rod.

**William
Partridge.**

In the "Calendar of State Papers" (Domestic Series), under date May, 1660, there appears the following petition to the king from Captain William Partridge, setting out "that hee was sworne servant to yo^r

Royall father of blessed memory, and so yo^r Ma^{ty} in the yeare 1645, to attend ye in the qualitie of a Clockmaker, and did officiate in that

place, all the time of his Ma^{ties} being at Oxford, And did likewise serve his Ma^{tie} a yeare and a halfe in his life Guard of foote ; And afeterwards did raise a Company att his owne charge ; And hath bene a great sufferer by Plundring Imprisonm^{ts} and expulcōns. Hee most humbly prayeth that yo^r Ma^{tie} will vouchsafe unto him the like grace and favor as to others of yo^r servants is extended, That hee may bee restored unto his said place of Clockmaker to yo^r Ma^{tie} w^{ith} all such priviledges and Impunities as belong unto it according to his warrant."

On the same page there is also a petition from Sarah his wife, begging that her husband's place may not be filled up until he has been heard for himself.

At the foot of the petition is the note, "To succcede Da. Ramsey." But nothing further is known of Partridge, and he may be passed over. The king's clockmaker, after Ramsay, really seems to have been Edward East, of whom more will be said hereafter.

THE CLOCKMAKERS' COMPANY.

In 1627 a proposal to grant letters patent authorizing French clockmakers to carry on their trade within the city appears to have occasioned an agitation among the London craftsman in favour of incorporation as a trade guild. Prior to that date, individual freemen had been associated with one or other of the existing companies, that of the blacksmiths having been most favoured. In 1630 a committee of clockmakers was formed, funds were raised to defray expenses, and petitions were addressed to the king, with the result that a charter was obtained from Charles I. on the 22nd of August, 1631.

In this document, "the Master, Wardens, and Fellowship of the Arts or Mystery of Clockmaking of the City of London" had very comprehensive powers for ruling and protecting the rights of the craft. They were entitled to make bye-laws for the government of all persons using the trade in London, or within ten miles thereof, and for the regulation of the manner in which the trade should be carried on throughout the realm. And in order to prevent the public from being injured by persons "making, buying, selling, transporting, and importing any bad, deceitful, or insufficient clocks, watches, larums, sun-dials, boxes, or cases for the said trade," powers were given to the company "to enter with a constable or other

officer any ships, vessels, warehouses, shops, or other places where they should suspect such bad and deceitful works to be made or kept, for the purpose of searching for them"; and, if entrance should be denied, they might effect it by force. Any such works as were faulty or deceitfully wrought they had power to seize and destroy, or cause them to be amended. Every member of the fellowship paid fourpence a quarter to meet the necessary expense of these searches. In 1708 this quarterage produced over £28.

By the charter, David Ramsay was appointed to be the first master; Henry Archer, John Willowe, and Sampson Shelton were the first wardens; and James Vantrollier (or Vautrollier), John Smith, Francis Foreman, John Harris, Richard Morgan, Samuel Linnaker, John Charlton, John Midnall, Simon Bartram, and Edward East, assistants of the said fellowship of the said art or mystery.

The charter also declared that future masters and wardens must be, or have been, professed clockmakers, an important regulation, which certainly appears to have been contravened in late years. The right of search was exercised regularly till 1735, when it was abandoned.

On the incorporation of the company, stringent by-laws were made regarding apprentices. No person was to take an apprentice without leave of the master, and then to have but one, until he shall be called to bear the office of master, warden, or assistant, and after that, not to exceed the number of two apprentices at any time whatsoever. But when his first apprentice had served five years, any member of the fellowship might take another, but not sooner, under a penalty of £10. And in the early history of the company several of its members were brought to account and fined for disobeying this regulation. Among them were several eminent members of the craft, including Thomas Loomes and Ahasuerus Fromanteel.

Then it was ordained that after an apprentice had served his time, he should serve his master or some other member of the fellowship for two years as journeyman, and produce his "masterpiece" of work before he was allowed to be a workmaster. This period of probation might, if the company saw fit, be commuted to one year on payment of a fine.

Those craftsmen who had joined the Blacksmiths' and other Companies prior to the incorporation of the Clockmakers', were from time to time admitted as "brothers" of the Clockmakers' Company.

As provided by the charter, the "court" or directorate consists of the master, three wardens, and ten or more assistants. The assistants are chosen for life from among the freemen, and the usual, but not invariable, course is that the assistants fill the higher offices in succession, according to seniority ; each one being elected first as junior warden, the next year as renter, the next year as senior warden, and the following year as master. After his retirement as master, he resumes his seat as an ordinary member of the court.

Occasionally members were transferred from and to other companies. In 1636 Mr. Richard Masterton was transferred from the Clothiers' at a cost to the Clockmakers' Company of £10 9s. 6d. A lesser sum sufficed for the transference, in the same year, of Mr. Dawson and Mr. Durant from the Imbroderers'. In 1724 Mr. John Shirley gave a bond to pay the Clockmakers' Company £20 for being transferred to the Vintners'. On Mr. James Masters applying in 1811 to be transferred to the Goldsmiths', a little haggling appears to have ensued. The Clockmakers' Company at first demanded £50 for consenting ; Masters offered £30 in 1812, and this amount was accepted. George Russell, in 1844, had to pay the Clockmakers' Company £30 for permission to be transferred to the Salters', and an additional £5 for a special meeting of the court to attend the Court of Aldermen with the Salters' Company.

In 1656 Ahasuerus Fromanteel and 31 other members complained to the Court that, in spite of members having to pay xii^d a quarter, the meetings were held in taverns. They also objected to the presence of Frenchmen among the ruling body, and recounted other grievances. A counter petition traversed the allegations, and asserted the confidence of the signatories in the management of the company.

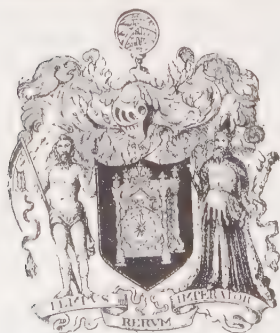


FIG. 79.

In 1671 the company obtained the right to bear arms, and in that year letters patent were granted for this distinction. They recounted "that whereof at present Nicholas Coxeter is Master, Samuell Horne and Jeffery Bailey are Wardens, as also Edward East, the only persons now living of those mentioned in the said Letters Patents of Incorporation, John Nicasius, John Pen-nock, Edmond Gilpin, Jeremie Gregory, Thomas Taylor, Thomas Clayton, John Freeman, Evan Jones, Isaac Daniell, John Browne, Nicholas Payne,

Richard Ames, and Benjamin Bell are Assistants, and to the rest of the Fellowship and Company thereof, and to their successors for ever. The Armes, Crest, Supporters and Motto hereafter mentioned, viz^t Sable, A Clock y^e 4 Pillars therefore erected on four Lyons, and on each capitall a globe with a Crosse, and in the midst an Imperial Crowne all Or, and for Their Crest upon an helmet Proper Mantled Gules Doubled Argent and Wreath of their Colours a Spheare Or, The Armes Supported by the Figures of a Naked Old man holding a Scithe and an Hour Glasse representing Time, and an Emporour in Roabes Crowned holding a Scepter, Their Motto—

TEMPVS RERVIM IMPERATOR.

As in the margent they are all more lively Depicted.”

In 1677 Mr. George Deane, engraver, a member of the company, “having by the hands of Henry Jones presented to this court the company’s coat of arms engraved on a copper-plate fit to be used for tickets and divers other occasions of the company which was very well liked, this court did kindly accept it, and returned him thanks.”

During the latter part of the seventeenth century the suitability of watchmaking as a profession for women was recognized, and in 1715 the company sanctioned the taking of female apprentices. The names of several will be found in the list at the end of this book, where also is recorded the admission of a few female members of the company. The employment of female labour in watch work does not, however, seem to have made much progress in England till watch factories were established in quite recent years.

In 1781 it was decided to elect leading members of the trade as honorary freemen. This course, politic as it probably was, seems to indicate that at this period the prestige of the company in the horological world was insufficient to induce distinguished craftsmen to take up the freedom in the ordinary way.

The company have never risen to the importance and comfort of possessing a hall of their own for meetings and other business. For brief periods during their history they had the use of a hall belonging to a more favoured guild, but most of their meetings were held in taverns, more than forty of these establishments having been so favoured. Their last meeting before the Great Fire of London was held on August 20th, at the Castle Tavern, in Fleet Street; and the first meeting after, on October 8th, 1666, at the Crown Tavern, in Smithfield. Later still the Devil Tavern, near Temple Bar, was patronized.

Only a certain number of freemen from certain of the companies is permitted to take up the livery or freedom of the City, the whole matter being in the discretion of the Court of Aldermen. The claims of the Clockmakers' Company were not recognized in this respect till 1766, when they were allowed to select 60 of their members for the privilege ; this number was upon petition increased to 120 in 1786, a still further increase to 200 was sanctioned in 1810, and in 1826 the present limit of 250 was reached.

No. 2 of the by-laws provided "that every person of the said Fellowship chosen in the said Livery shall accept and take upon him to be of the said Livery, and shall within fourteen days after notice of such election, take such oaths as by these ordinances shall be appointed for him."

The honour of election to the livery does not seem to have been always appreciated, for in 1813 "William Mansell, of Rosoman St., Clerkenwell, Watch casemaker, who was summoned to take the Livery on the 19th August, 1812, again on 7th September, 1812, and repeated on the 11th October last, was peremptorily summoned to be at this court, and being now in attendance for the first time, refused to take the Clothing, and the penalty of Fifteen Pounds being awarded against him for such refusal, he paid the sum in Court, and his Election to the Livery was thereupon discharged."

"William Welborne, of Leather Lane, Holborn, has been summoned to take the Livery in November, 1811, and also in January, February, and July, 1812, but having failed so to do, was again summoned for that purpose to the last Quarter Court, when he attended and requested until this day promising either to take the clothing or pay the penalty for refusal, he being now present and declining to take the same, the penalty of £15 was ordered to be enforced, which being paid in Court, his election to the Livery was likewise thereupon discharged."

The fine on taking up the livery was then fixed at £21.

In 1820 it was resolved to allow the quarterly payments or quarterage from members in support of the company to be commuted by an immediate payment ; the amount to be paid being dependent on the age of the member availing himself of the arrangement.

The fee to be paid on taking up the freedom of the company by purchase was in 1876 increased to £20.

In 1873 the company handed over its library and museum to the Corporation of London, and they are now accessible to the public in

the Guildhall. This is, of course, a gain for the community ; still, one cannot help regretting that the directorate of a guild so closely identified with the most brilliant members of the craft in its early history, should have resigned the duties cast upon it by the charter of incorporation, and thus have lost its hold upon the clock and watchmaking trades.

Edward East, watchmaker to Charles I., was a true

Edward East. horologist and a worthy successor to David Ramsay.

He at one time resided in Pall Mall, near the tennis court, and attended the king when tennis and other games were being played in the Mall, his Majesty often providing one of East's watches as a prize. Edward East seems to have removed to Fleet Street, for it is related that at a later period the king's attendant, Mr. Herbert, failing in the punctual discharge of his duties in the morning, his Majesty provided him with a gold alarum watch, which was fetched from the king's watchmaker, Mr. East, in Fleet Street. The locality of a presumably still later residence is indicated by a reference to "Mr. East at the Sun, outside Temple Bar," in the *London Gazette*, January 22-26, 1690. A very large silver alarum clock-watch by Edward East, which was kept at the bedside of Charles I., was presented by the king on his way to execution at Whitehall, on January 30, 1649, to his faithful and attached servant, Mr., afterwards Sir, Thomas Herbert. It was illustrated in "Sussex Archeological Collections," 1850, and in the *Archæological Journal*, vol. vii., from which Figs. 180 and 180A, two-thirds the size of the watch, are reproduced. I presume its history is well authenticated. The owner of it, Mr. William Townley Mitford, was quoted as saying, "It came into possession of my family by intermarriage with the Herberts about a century ago, and since that time has remained with us," and the Society of Antiquaries seemed to be quite satisfied with their examination. Still, from the engravings, it is rather a perplexing watch. The dial and pierced back are of Charles I. period, and though a minute hand at that date would be very unusual, it would not be an impossible adjunct ; presumably there was also an hour hand, but I can see no alarum disc or indicator ; the centre of the dial may, of course, have been turned to set the alarum, but there is no sign of its having been so utilized. Amongst the collection of autographs and manuscripts in the possession of Mr. Alfred Morrison, of Fonthill House, Wilts, is a warrant, dated June 23rd, 1649, from the Committee of Public Revenue to Thomas Fauconbridge, Esq., Receiver-General, authorizing him to pay "vnto Mr. Edward East,

Watchmaker, the so'me of fortie pounds for a Watch and a Larum of Gould by him made for the late King Charles by directions of the Earle of Pembroke, by order of the Committee, and deliuered for the late King's use the xviith of January last." In the Fellows collection at the British Museum is a splendid octangular crystal-cased watch, a recumbent female figure holding an hour-glass being engraved on the dial; 1620 is mentioned as the probable date of this specimen of East's work. Wood refers to another watch by him with a silver case in the form of a cross, the dial being engraved with the crucifixion and angels.

In the Ashmolean Museum at Oxford is a watch by East with gold



FIG. 180.



FIG. 180A.

Watch of Charles I.

case in the form of a melon. Two other undoubted specimens of this master's work are in the Guildhall Museum. One, a watch movement, inscribed, "Eduardus East, Londini," was thus described by E. J. Thompson: "Thé fusee of ten turns is cut for gut. There are great second and contrate wheels, and a left-handed cut balance wheel, the verge being of course left-handed. The end of the verge is driven into the balance, which has one straight bar or arm. The cock is secured on a stud by a pin. There is no provision for a balance spring, and the regulating must have depended upon the setting up or down of the mainspring by the endless screw. It had one hand only. The fusee is hollow, having the cap and winding

square solid ; it is fitted on to an arbor riveted on the great wheel. The great wheel has fifty-five, the second forty-five, the contrate forty, and the balance-wheel fifteen teeth ; the second, contrate, and balance pinions being all of five leaves."

The second example is a watch in a silver oval case with hunting cover, having a crystal centre which Mr. Thompson described as finely worked in to suit its shape. The dial is of silver, and is traversed by an hour hand only. The movement is inscribed, as in the first instance, "Eduardus East, Londini." There is a twelve-turn fusee cut for catgut. The mainspring is white and no doubt original.

For the appended view of a clock-watch with a finely pierced and engraved silver inner case, I am indebted to Mr. Percy Webster.

In the British Museum is a watch of his make with a tortoiseshell case, dating from about 1640. South Kensington Museum also possesses a specimen of his work. Mr. George Carr Glyn exhibited at the Guelph Exhibition a clock-watch by him in silver pierced cases.



FIG. 181.—Clock-watch by Edward East.

Edward East was one of the ten original assistants named in the charter of incorporation of the Clockmakers' Company, and at once took a leading part in their proceedings, and after serving in the subordinate capacities was elected master in 1664, a post he again occupied in 1682. He was the only treasurer ever appointed, and the creation of the office came about in a curious way. In 1647, the renter warden, Mr. Helden, refused to give the usual security for the stock of the company, and in this dilemma the office of treasurer was created, Mr. East and Mr. Hackett being nominated thereto, and the former chosen. On the death of Mr. East the office was allowed to lapse.

Edward East lived to a good age. There is no record of his death, but it probably occurred not long after 1693. In 1692 his

quondam apprentice and friend, Henry Jones, who was then Master of the Clockmakers' Company, acquainted the Court that Mr. East desired during his lifetime to make a gift of £100 to the company for the benefit of the poor. Mr. Jones added that he would also contribute a like sum for a similar purpose. In the following year Mr. East gave the £100, and it was ordered "that the master and wardens do go to Mr. East and give him hearty thanks for his charity."

Henry Jones, already referred to, was apprenticed to **Henry Jones.** Edward East on August 22nd, 1654. He was made free of the Clockmakers' Company in 1663, and served as Master in 1691-92. He resided near the Inner Temple Gate, and attained a considerable reputation, which was quite justified judging from what remains of his work. Charles II., according to tradition, gave to Mrs. Jane Lane a clock, in memory of her services after the battle of Worcester. On the clock was engraved, "Henricus Jones, Londoni." In Overall's "History of the Clockmakers' Company" is a record which just possibly refers to this clock. It states that, on January 19th, 1673, "Mr. Henry Jones, clockmaker, acquainted the Court of the Company that he had made for the King (Charles II.) a clock of the value of £150, whereon was engraven 'Henricus Jones, Londoni,' and which stood in His Majesty's closet for about seven years, but being by His Majesty given unto a lady it came into the hands of Robert Seignor, clockmaker, of Exchange Alley, to be repaired, and he caused Edward Staunton, clockmaker, or some other person, to take out the maker's name and insert his own."

In North's "Life" it is stated that barometers were first made and sold by one Jones, a noted clockmaker in the Inner Temple Gate, at the instance of Lord Keeper Guildford; and very probably Jones was the first *Englishman* who constructed a Torricellian tube, as the barometer was originally called, after its inventor, Evangelista Torricelli, who propounded its theory about 1650.

In the *London Gazette* for October 21st to 24th, 1689, was the following advertisement: "Lost on the 21st Instant, between the Hay Market near Charing Cross and the Rummer in Queen St. near Cheapside, a round Gold Pendulum Watch of an indifferent small size, showing the hours and minutes, the Pendulum went with a strait Spring, it was made by Henry Jones, Watchmaker in the Temple, the Out-Case had a Cypher pin'd on it, and the Shagreen much worn. If it comes to your hands, you are desired to bring it

to the said Mr. Jones or Mr. Snag, a goldsmith in Lumbard Street, and you shall have two Guineas Reward."

In the Guildhall Museum is one of Henry Jones's watches, which Mr. E. J. Thompson speaks of as having very fine pillars. Another watch by the same maker is in the collection of Mr. Evan Roberts.

The bracket clock with basket top "squat" case shown herewith, was sketched from an example by Henry Jones, by favour of Mr.

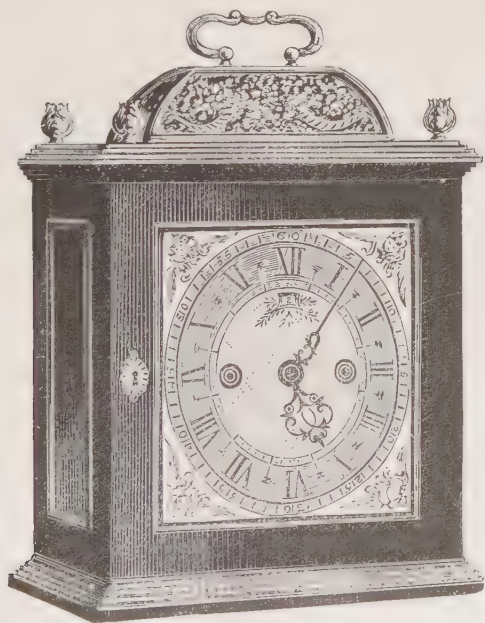


FIG. 182.—Clock by Henry Jones.

Percy Webster. The chased open basket-work and corner ornaments are particularly choice.

Mr. Holden, of Yeadon, has an eight-day long inlaid case-clock with a brass dial, inscribed "Henry Jones in ye Temple," which is a later production than any of those already quoted.

Henry Jones, who was the son of William Jones, vicar of Boulder, Southampton, died in November, 1695, aged 53 years, and was buried within the precincts of the old church of St. Dunstan's in the West, Fleet Street, where a monument was erected to his memory by his widow.

This talented man was born near Warrington in 1636. He was ordained in the English Church at Lisbon, and took the name of Barlow from his godfather, Ambrose Barlow, a Benedictine, who suffered at Lancaster for his religion. Edward Booth devoted considerable attention to horological instruments. He was undoubtedly the inventor of the rack repeating striking work for clocks, which was applied by Tompion about 1676. He also devised a repeating-watch on the same principle, and made application to patent it in 1686. His claim was successfully opposed by Daniel Quare, who was backed by the Clockmakers' Company. The king, James II., tried both watches, and gave his preference to Quare's, which repeated the hours and quarters with one push from a pin near the pendant, whereas Barlow's watch was furnished with a pin on each side of the pendant and required two distinct operations to attain the same end.

Booth invented the cylinder escapement, and patented it in conjunction with William Houghton and Thomas Tompion in 1695 (No. 344). The invention is described as a "ballance wheele either flatt or hollow, to worke within and crosse the centre of the verge or axis of the balance with a new sort of teeth made like tinterhooks to move the balance and the pallets of the axis or verge, one to be circular, concave, and convex." He died in 1716.

Fig. 183 shows a watch by Samuel Betts remarkable for its particularly handsome dial of silver and brass.



FIG. 183. Watch by Samuel Betts, about 1640 (A S).

The central leaf ornament of silver polished is partly filled in with crimson enamel or hard wax, the pretty effect of which is enhanced by a dull matted surface between it and the hour band, which is also of silver. On a nicely chased revolving brass ring outside the hours is a *fleur-de-lys* to indicate the day of the month on a fixed silver band, divided into thirty-one and figured as shown. An outer chased margin of brass completes the arrangement. At the end of the short months the day of the month ring has to be moved

by hand. The boss of the hour indicator is oval, and although but one limb now exists there was probably a trident tail as may be seen on other specimens of the period. The case is of silver with a hit-and-miss shutter over the winding hole, the glass is nearly one third of a sphere and exceedingly thick. Betts carried on business at the back of the Royal Exchange, and appears to have died prior to 1673 when "Mr. Marquet" (Markwick?) advertises himself in the *London Gazette* as the successor of "Mr. Samuel Betts, deceased." In 1656 Betts attested the genuineness of Jas. Lello's masterpiece to the Clockmakers' Company. The watch here shown dates from about 1640.

Tompion and Graham.

Thomas Tompion, "the father of English watch-making," was born at Northhill, Bedfordshire, in 1638. It is said that his father was a farrier, and that he was brought up to the same trade; but the first reliable record shows him to have been in business as a clock-maker at Water Lane, Blackfriars, when quite a young man.

Water Lane was a long, tortuous thoroughfare, the western portion of which is now Whitefriars Street, and Tompion's shop, known by the sign of the Dial and three Crowns, was at the Fleet Street corner where the offices of the *Daily News* are. His advent marks a distinct epoch in the history of the horological art. Throughout his career he was closely associated with some of the leading mathematicians and philosophers of his time. The theories of Dr. Hooke and the Rev. Edward Barlow would probably have remained in abeyance but for Tompion's skilful materialization of them. He soon became the leading watchmaker at the court of Charles II., and was everywhere welcomed as an artist of commanding ability. When he entered the arena the performance of time-keepers was very indifferent. The principles on which they were constructed were defective, and the mechanism was not well proportioned. The movements were as a rule regarded as quite subsidiary to the exterior cases, and English specimens of the art had no distinctive individuality. By adopting the inventions of Hooke and Barlow, and by skilful proportion of parts, he left English watches and clocks the finest in the world and the admiration of his brother artists. Of course he did not reach finality; improvements continued under his immediate successors. Indeed, some of the most remarkable and progressive horological conceptions emanated from the mind of his favourite pupil, Graham, whom he inspired, and who continued the work which Tompion began.

Of the few horologists of Tompion's time who can be admitted as his peers, Daniel Quare was perhaps the most notable example.

Among others above mediocrity who made watches before and after the introduction of the balance spring, Nathaniel Barrow is worthy of mention.

Tompion was primarily a clockmaker, and it is doubtful if he made watches in the early part of his career. I have never met



FIG. 184.—THOMAS TOMPION, 1638—1713.

with a specimen not furnished with a balance spring, and those with but an hour hand are exceedingly rare.

By favour of Mr. Percy Webster, of St. John's Wood, I am enabled to give the annexed drawing (Fig. 185) of one of Tompion's earlier clocks which Mr. Webster has in his possession. It has a light pendulum six inches in length fixed to the verge; the escapement for the alarum is behind the going train, and when the alarum

is let off the hammer strikes the bell which forms the domical top of the clock. In the British Museum is another chamber clock by Tompion, as well as a very thick watch by the master in a case superbly painted in enamel by Camille André. In the same repository is a curious universal pocket sun-dial with compass, all of gold, also by Tompion.

In 1675, he made for Charles II. a watch with two balances and balance springs as devised by Hooke. Derhamsays, "This watch was wonderfully approved of by the King; and so the invention grew into reputation and was much talked of at home and abroad. Particularly its fame flew into France, from whence the Dauphine sent for two; which that eminent artist Mr. Tompion made for him."

The introduction of the balance spring involved a reconstruction of the watch movement. The disc or dial for indicating the adjustment of the mainspring was discarded as no longer necessary, and a somewhat similar one introduced for showing the movement of the curb pins round the balance spring. This disc was placed upon a pinion with a squared extremity for the reception of a watch key to actuate the curb pins, which were carried by a toothed segment or circular rack gearing with the pinion. The tangent wheel and screw for mainspring adjustment were placed between the plates. The balance was considerably enlarged and covered with a circular cock. In Tompion's early watches there is a kind of bevelled fringe around the edge of the cock for the more effectual protection of the balance, as in Fig. 187, but after 1688 or 1690 he adopted the now well known form with a broad base curved to suit the edge of the plate, a circular table the same size as the balance, and just where the table narrows to join the base a



FIG. 185.

x

cherub's head or a grotesque mask engraved between projecting ears or streamers.

His watch movements were deep, with the celebrated "tulip" or other elaborately worked pillars, top plates exceedingly thin, and near the edge was usually engraved, "Tho. Tompion, London."

He was I believe the first manufacturer to number his watch movements consecutively in plain figures for the purpose of identification. His early ones were not so marked, and I should judge he commenced the practice about 1685.

Fig. 186 shows a watch by him in plain gold cases, bearing the hall mark corresponding to 1685; the dial is of gold with raised numerals. The hands are very fine, the hour indicator being of the tulip pattern.



As an example of the versatility of Tompion's genius, is appended a drawing of a watch from the collection of Mr. Evan Roberts. The distinctive feature of this watch is that, although a verge escapement is used, the fusee has been discarded and a mainspring barrel of the stationary or "resting" type adopted. In order that

FIG. 186.—Watch by Tompion in plain gold cases (A S).



FIG. 187.

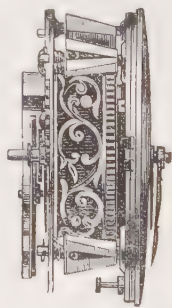


FIG. 188.

the watch might have a barrel of the largest possible dimensions, what is usually the *centre* wheel is planted out of the centre; the cannon pinion rides loose on a stud planted in the centre of the frame; and to get the proper motion for the minute-hand without the introduction of an intermediate wheel in the motion work, the

train rotates reversely to the usual direction. The movement is not numbered ; this fact, together with the style of the engraving and the form of the balance cock, enables one to fix the date of its production.

Prior to September, 1695, Tompion produced a watch in which the teeth of the horizontal escape wheel dropped on to the cylindrical body of the verge, as shown in the appended drawing, thus avoiding the recoil incidental to the usual verge construction ; and in September, 1695, he, in conjunction with Booth and Houghton, patented the cylinder escapement. In the account of Barlow the wording of the description is given.



FIG. 189.

During the building of St. Paul's, it was frequently reported that Tompion was to construct a wonderful clock for the cathedral ; and in " *The Affairs of the World*," published in October, 1700, the following announcement appeared : " Mr. Tompion, the famous watch-maker in Fleet Street, is making a clock for St. Paul's Cathedral, which it is said will go one hundred years without winding up ; will cost £3000 or £4000, and be far finer than the clock at Strasburg." Though this statement seems to have been unwarranted, it is quite possible he would have been entrusted with the construction of a timekeeper of some kind, but after unremitting application to his profession for more than thirty years, he was at this time, it may be assumed, just beginning to indulge in well-earned leisure ; for the last years of his life he allowed himself considerable relaxation, and was absent from London for extended periods. During his migrations he visited Bath, possibly to derive benefit from the healing properties of the hot mineral water which wells up in the Queen of the West, as the chief Somersetshire city is called. In the Grand Pump-room there is a splendid example of Tompion's later work, which he presented to the city, as is thus recorded on a tablet adjacent to the timekeeper : " The Watch and Sun-dial was given by Mr. Thos. Tompion, of London, Clockmaker. Anno Dom. 1709." I am enabled to give two engravings of this stately timekeeper. For Fig. 190 I am indebted to Mr. Ernest Lambert, who succeeded in taking an excellent photograph of it which shows the dial well. Mr. R. E. M. Peach had the drawing (Fig. 191) made for me. It gives a good idea of the side of the case. Mr. Olds has kindly furnished some description of the movement.

The dial is of brass, with ornamental corner pieces and silvered rings ; minute circle 15 ins. in diameter ; seconds circle and day of

the month through an opening. On a high arch above is an equation index and scale, 0 being in the centre, and the variation to a maximum of 15 minutes shown on each side; on the right,



FIG. 190.—Clock by Tompion at the Pump-room, Bath.

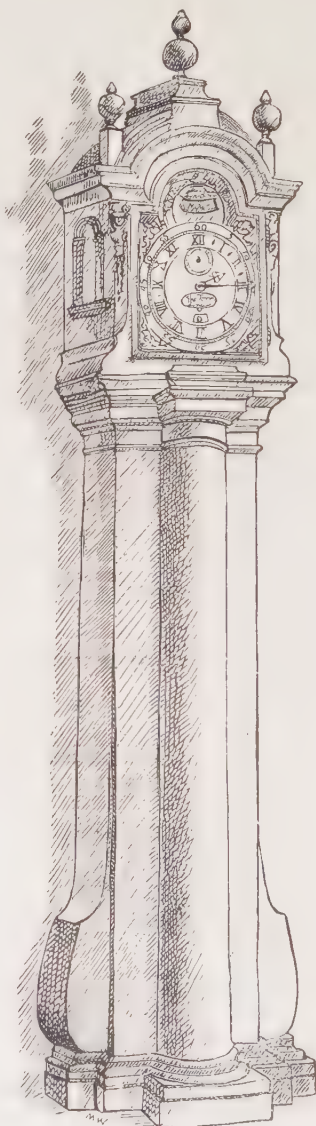


FIG. 191.—Clock by Tompion at the Pump-room, Bath.

"Sun faster," and to the left, "Sun slower." The months and days are engraved on a silvered 10-inch circle, of which an arc of sixty-two days is shown through an opening. The date is indicated by a small point in the centre of the opening. The number of minutes shown by the index gives the difference between sun time and mean time: this 10-inch circle has over 2000 finely cut teeth, and makes its annual circuit by means of an endless screw and pinion, worked from the dial wheel, which makes one revolution per hour. The index is kept in position by a small counterpoise with pulley fitted to its arbor; the pulley is attached by a fine chain to a "cranked" arm, which rises and falls with the indentations and protuberances of a properly shaped plate or cam attached securely to the 10-inch circle.

The train and frame of the timepiece are in remarkably good order, considering its age. The driving-power is a lead weight of 32 lbs. hung on a 3-in. pulley, having a fall of 6 feet. It is wound monthly on to a $2\frac{1}{2}$ in. barrel; the great wheel of 94 teeth, and $4\frac{3}{4}$ inches in diameter, drives a pinion of 16 leaves; thereon is a 3-in. wheel of 80 teeth, and this drives the centre pinion of 10 teeth; this is a $2\frac{7}{8}$ in. wheel of 72 teeth, driving the third pinion of 9 teeth; on this is a $2\frac{5}{8}$ in. wheel of 60 teeth, driving the escape pinion of 8 teeth; on this is a 2 in. escape wheel of 30 teeth, shaped as in a recoiling escapement. The pallet staff is $2\frac{1}{4}$ in. above the escape arbor, and carries pallets of the anchor pattern, having inclined planes to allow recoil. The one-second pendulum rod is of steel, of a flattened oval section, with 6 in. bob of lenticular form. The amount of oscillation, being only $2\frac{1}{4}$ in., causes the recoil of the escapement to be barely apparent.

The day of the month circle is moved by an extra wheel from the hour wheel. Maintaining power while winding is given by a spring-propelled click through a steel arm on an arbor between the plates, acting on the teeth of the centre wheel, which is put into action by lifting the sliding cover of the winder hole in the dial.

The case is of solid unpolished oak, 9 feet high to the top of the arched head which is surmounted by brass ball ornaments. The body of the case is 17 in. wide and about 6 in. narrower than the head and base, with a semi-circular door 8 in. across and 5 feet in length. As will be seen from the drawing, the case has much the appearance of a pillar rising from a substantial base.

The clock is in a recess at the eastern end of the room, and it occupied a similar position in the old Pump-room, the erection of

which was finished in 1706. As the spot is particularly suited for the reception of a clock, it may be conjectured that Tompion was in Bath when the old Pump-room was being built, and that the ever-vigilant "Beau" Nash obtained from him a promise to present a timepiece when the building was completed.

At first sight the phrase "watch and sun-dial" on the tablet recording the gift seems to include a gnomon of some sort for regulating the timekeeper from observations of the sun. There would be nothing far-fetched in this surmise, because sun-dials to check the going of public timekeepers were not at all an unusual adjunct. But I am inclined to think that in this instance sun-dial meant the equation dial over the ordinary one.

A timepiece by Tompion at the Admiralty is illustrated by Fig. 324, a long case chiming clock by him to go a month between windings which is at Windsor Castle is shown in Fig. 322, and at Buckingham Palace is a very similar one. At the Guildhall Museum is a Tompion clock with a square dial, one hand and in a long black case, which may be accepted as an indubitable example of his early work. In the same collection is a more modern specimen which goes months between windings; has an arch dial, and maintaining work similar to that in the Bath Pump-room clock. It is inscribed "Thomas Tompion, London," a form of signature rather unusual.

The Royal Society possesses a paper in Hooke's handwriting, imperfect and undated, showing that Tompion and Hooke were in communication on the subject of the barometer, which is of interest as evidence of the estimation in which Tompion was held by Hooke. It occurs about the middle of a parchment-bound volume lettered "20 Hooke's Papers," and is headed "Aerostatick Instruments." In it Hooke states that a form of his barometer, in which the height of the mercury was indicated by a column of water, "was tryed at Mr. Thomas Tompion's, a person deservedly famous for his excellent skill in making watches and clocks, and not less curious and dexterous in constructing and handworking of other nice mechanical instruments."

The extent of Tompion's business may be judged from the fact that in the advertisements for the recovery of lost watches during the period he was in business, timekeepers of his make largely preponderate. Trivial though some of them may be, I venture to submit a selection from these announcements as the quaint descriptions in the words of the owners are interesting and convey

a very good idea of the various styles in favour at the time. "Lost out of a gentleman's Pocket, the 19th past, betwixt Lyme St. end in Fenchurch St. and the end of the Minories, an indifferent small size gold pendulum watch, going without string or chain, showing the hours of the day, and day of the month, the name Tompion, in a shagreen case, pinned with a Cypher in the bottom of the case, wound up on the dial plate, at the hour of 12, a straight key with a Steel Nose. Whoever brings it to Mr. Tompion, Clockmaker, at Water Lane, and in Fleet St., shall have one guinea reward, or, if bought, their money again with reasonable profit" (*London Gazette*, November 10-13, 1690).

"Lost, the 3rd inst., betwixt the Sun-Dial, in St. James Park, and Man's Coffee House, a silver Minute Pendulum watch, made by Tho. Tompion, in a Shagreen studded case, on the bottom of the inner case the number 458; with a gold Ring hanging upon the silver chain, with the Effigies of their Present Majesties" (*London Gazette*, March 3-7, 1691).

"Lost on the 24th instant, about Kingston-on-Thames, a Gold Minute and Second Chain Pendulum watch, with a Stop, the hours seen through a hole in the Dial plate, and in a plain Shagreen Out-Case, the name Tho. Tompion, London, a number in the bottom of the Box, 0201. Whoever gives notice of it to Mr. Tho. Tompion, Clockmaker, at the corner of Water Lane, in Fleet St., shall have 3 guineas reward; or if bought already, your money again with reasonable profit" (*London Gazette*, June 25-29, 1691).

"Lost on the 23rd instant a Gold Pendulum Watch made by Thos. Tompion, Fleet Street, in a Shagreen Studded Case with a Steel Seal set in gold tied to it, bearing a Coat quartered with the arms of the Crown battoned; the Box numbered 422 and the maker's mark [II]" (*London Gazette*, July 23-27, 1691).

"Lost on the 21st instant, from the Duke of Richmond's in St. James's Square, a gold striking watch with a Shagreen case studded round, with little holes between, having 3 links of plain gold chain, made by Thos. Tompion, in Fleet St. Whoever brings it to Mr. Compton, Goldsmith, in Duke St., near Lincoln's Inn Fields, shall have 6 Guineas" (*London Gazette*, February 21-23, 1694).

"Lost, some time in November last, at Oxon, a Gold Minute Pendulum watch in a plain gold case; the names on the upper peak, Tho. Tompion, Edwd. Banger, London; and on the Dial Plate, Tompion, Banger, London, with this number, 3428, on the

bottom of the Box within side, and likewise upon the upper plate. Whoever give notice of it (so as it may be had again) to the Reverend Dr. King, of Christ Church College, at Oxon, or to Tho. Tompion, Clockmaker, at the Dial and Three Crowns, at the Corner of Water Lane, Fleet St., London, shall have three guineas reward; or if bought or pawned, your money again with reasonable profit" (*London Gazette*, December 4-7, 1704).

Tompion was made free of the Clockmakers' Company in 1671; chosen as assistant in 1691; as warden in 1700, and master in 1704. He died on the 20th November, 1713, and was buried in Westminster Abbey. In the same grave were interred the remains of Graham, and particulars of their tomb had therefore better be left till after the brief notice of Graham which follows.

Little is known of Tompion's domestic life, but he appears to have been unmarried. His will, executed on the 21st of October, 1713, was proved on the 27th of November, in the same year, by George Graham, who was one of the executors. By this document he bequeathed to his nephew Thomas Tompion, son of his brother James, his land and property at Northhill, Bedfordshire, and the interest on £100: to his niece Margaret Banger, wife of Edward Banger, clockmaker, and daughter of his late sister, Margaret Kent, he gave a life interest in £500 which at her death was to revert to Elizabeth Graham, wife of George Graham, daughter of his said brother James. Another daughter of his sister Elizabeth Kent is mentioned and a cousin, Thomas Finch. George Graham and his wife were residuary legatees. Tho. Tompion, junr., was apprenticed to Charles Kemp in 1694 and admitted as a member to the Clockmakers' Company in 1702, presumably when he had completed his apprenticeship. A "Mr. Tompion, watchmaker," attended the funeral of Daniel Quare, in 1724. Watches by Tho. Tompion, junr. are to be met with occasionally, and I have examined two or three inscribed "Tho. Tompion, Edw. Banger, London." Edward Banger was apprenticed to the Tompion in 1695, and it may therefore be fairly assumed that he was in partnership with Tompion junr. At Buckingham Palace is a one year clock inscribed "T. Tompion, Edwd. Banger, London." I saw a watch for sale but a few months ago, inscribed "Tompion, London," the hall mark in the case of which corresponded to the year 1745. But Tompion bequeathed his business to Graham, who, it is pretty certain, secured the best of the trade on the demise of his patron and friend.

**George
Graham.**

George Graham, "Honest George Graham," who was born at Kirkclinton, or Rigg, Cumberland, in 1673, tramped to London at an early age, and in 1688 became apprenticed for seven years to Henry

Aske. He was admitted a freeman of the Clockmakers' Company on completing his indentures in 1695, and immediately entered the service of Thomas Tompion, thus beginning a life-long friendship, severed only by the death of Tompion in 1713. The following announcement appeared in the *London Gazette* for November 28th to December 1st, 1713: "George Graham, Nephew of the late Mr. Thomas Tompion, who lived with him upwards of 17 years, and managed his trade for several years past, whose name was joined with Mr. Tompion's for some time before his death, and to whom he left all his stock and work, finished and unfinished, continues to carry on the said trade at the late Dwelling House of the said Mr. Tompion, at the sign of the Dial and Three Crowns, at the corner of Water Lane, in Fleet Street, London, where all persons may be accommodated as formerly."

In 1720 Graham relinquished Tompion's old premises, as will be seen by the appended official notification from the *London Gazette* of March 22-26, 1720: "George Graham, watchmaker, is removed from the corner of Water Lane, in Fleet Street, to the Dial and One Crown on the other side of the way, a little nearer Fleet Bridge, a new house next door to the Globe and Duke of Marlborough's Head Tavern." Here in the rooms over the shop Graham resided till his decease. The quaint little shop had two plain bowed windows, with the doorway between them, and with but little alteration in appearance remained as a watchmaker's for many years, being occupied first by Mudge, who succeeded Graham, then by Mudge and Dutton, and afterwards by the younger Duttons. It is No. 148, and now the offices of the *Sporting Life*. Graham was elected as a fellow of the Royal Society in 1720, and was chosen as a member of the council of that body in 1722. He contributed twenty-one papers on various subjects to the "Philosophical Transactions."

After the expiration of Booth, Houghton, and Tompion's patent, Graham devoted some thought to the cylinder escapement, which in 1725 he modified to practically its present form, and introduced into some of his watches. Securing to himself the monopoly of any of his discoveries was foreign to his disposition. The reputation which English horology acquired on the Continent during the

eighteenth century was due in no small measure to Graham's candid treatment of his brethren in the art in other countries. In answer to inquiries, Julien Le Roy received from Graham one of his cylinder escapement watches in 1728, and the French horologist's generous avowal of its superiority is worthy of his acknowledged greatness. But it must be admitted, after examination of surviving specimens, that the wheel teeth in Graham's cylinder escapement had too much shake in the cylinder, and were wanting in the necessary closeness of construction afterwards attained by Ellicott and others; and as Graham continued to use the verge escapement till his death, it may be assumed that he was not oblivious of the constructional difficulties presented by the cylinder. In his younger days he would undoubtedly have pursued the

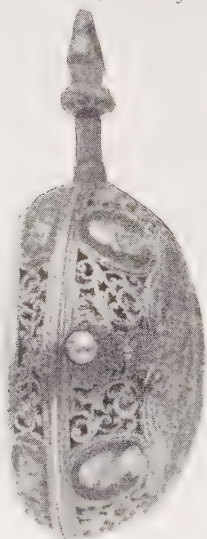


FIG. 192.



FIG. 193.—Back of outer cover.

matter with his usual acumen and patience, till nothing was left for later artists to improve; but now his mind was taken up with astronomy and astronomical instruments, and the production of a perfect clock as an aid to the astronomer absorbed him, as I venture to suggest, almost to the exclusion of horological instruments for the pocket.

In all Graham's work his first consideration was to make every part most suitable for its purpose. Judicious embellishment in its proper place was not wanting, but it was quite subsidiary to usefulness. This trait is apparent in many little details of a splendid repeating watch shown in Figs. 192 and 193, and which was made by

him in 1714, when he was in the zenith of his power as a watch-maker. Thus the pillars are of a plain cylindrical form with turned bases and caps, whereas Tompion before, and Ellicott, Mudge, and other distinguished horologists after him, were lavish in shaping, decorating, and piercing these passive items, whose characteristic of strength and holding power was certainly not less apparent by

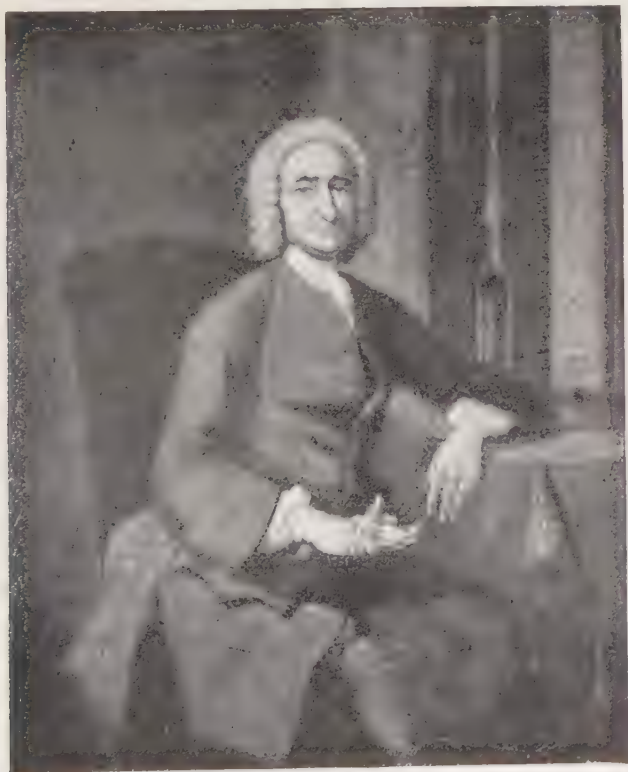


FIG. 194.—GEORGE GRAHAM, 1673—1751.

Graham's more simple treatment. A little addition I have not noticed in the watches of any other maker, is a light spring jumper or click on the under side of the cap, for securely locking the cap spring. It has a fine enamelled dial and jewelled balance cock. The piercing of both the gold cases and the *repoussé* chasing of the outer one are perfect. On the movement and on both cases is the number 445. On the back of the inner case are the letters M.P.

arranged as a monogram. The lock spring is beyond the edge of the dial.

Attached to this repeater is also a useful little adjunct which appears to have been invented by Graham, and, though not much seen in English work, became very popular with French makers. Projecting from the case is a small nib, or "pulse piece," called by the French *sourdine*, or "deaf piece," which upon being pressed keeps the hammer off the bell and receives each blow. It not only enables those who have defective hearing or sight to ascertain the time by touch, but persons whose organs are perfect, who may desire to know the hour at night without disturbing an adjacent sleeper, can do so by pressing the pulse piece and counting the beats.

Graham used stout proportionate-looking bows for his watch cases in place of the thin wiry rings heretofore in vogue, but by a curious obliquity, Ellicott seems to have reverted to the former style. The difference in the two "handles" is very marked in specimens of the two makers I have before me.

With the introduction of the pendulum, and more exact workmanship and consequent improvements in the performance of timekeepers, the errors arising from the expansion and contraction of metals in varying temperatures became manifest. Graham therefore turned his attention to the best means of preventing irregularity in the going of clocks when exposed to thermal changes, and invented the mercurial pendulum. His paper, communicated to the Royal Society in 1726, on "A Contrivance to avoid Irregularities in a Clock's Motion by the Action of Heat and Cold upon the Pendulum," demonstrated the suitability of mercury as a compensating medium after observations extending over a lengthened period.

The form of Graham's mercurial pendulum is shown in the sketch, Fig. 196. *a* is the rod, *b* the stirrup containing the glass jar of mercury, *c*. For regulating the time, Graham employed a sliding weight, *d*, upon the rod.

Another of Graham's inventions applicable to clocks of precision, and which is still unsurpassed in the opinion of many leading horologists, is the dead-beat escapement.



FIG. 196.

An elegant bracket clock by him, dating from about 1740, is in the possession of Mr. J. Rutherford, Jardington, Dumfries, to whom I am indebted for the annexed representation of it. The case of oak measures $15\frac{1}{2}$ inches in height, and the dial $8\frac{1}{2}$ inches by $4\frac{7}{8}$ inches.



FIG. 195.

On the back plate is engraved a Cupid surrounded by scroll work. The regulator hand on the right of the dial raises or lowers the pendulum through the intervention of a snail-shaped cam.

Graham's mode of living was distinguished by its simplicity. As already stated, his later years were chiefly occupied with astro-

nomical work, which he carried on as the valued coadjutor of Halley and Bradley till his death, which occurred in November, 1751. By his will, executed in 1747, he left to his wife one-half of his personal estate. He also bequeathed £20 to the Clockmakers' Company, of which he was made free in 1715, and after filling the subordinate offices served as master in 1722-3. The grave of Tompion, in Westminster Abbey, was opened to receive his pupil, and the exceptional honour of their interment in that place is the best testimony that can be adduced as to the estimation in which these eminent horologists were held. Appended is a reduced facsimile of the stone placed to mark their resting-place by an appreciative nation.

HERE LIES THE BODY
OF M^R THO TOMPION
WHO DEPARTED THIS
LIFE THE 20TH OF
NOVEMBER 1753 IN THE
75TH YEAR OF HIS AGE

ALSO THE BODY OF
GEORGE GRAHAM OF LONDON
WATCHMAKER AND F.R.S.
WHOSE CURIOUS INVENTIONS
DO HONOUR TO Y^R BRITISH GENIUS
WHOSE ACCURATE PERFORMANCES
ARE Y^R STANDARD OF MECHANIC SKILL
HE DIED Y^R XVI OF NOVEMBER MDCCLI
IN THE LXXVIII YEAR OF HIS AGE

At the beginning of the present century this slab was removed, and small lozenge-shaped stones, with the name and date, as in the

sketch below, were substituted. In a little work, "Time and Timekeepers," published in 1842, Adam Thomson, a Bond Street watchmaker, wrote: "Who would suppose that a small lozenge-shaped bit of marble is all that is left to indicate where lie the bodies of the 'Father of Clockmakers,' Thomas Tompion, and Honest George Graham, greater benefactors to mankind than thousands whose sculptured urns impudently emblazon merits that never existed?" To this outspoken, indignant protest, and the good feeling of the late Dean Stanley, is due the reinstatement of the original memorial, for which English horologists will be ever grateful. "The passage was pointed out to me by a friend," said the Dean, "in consequence of the strong irritation expressed on the subject by an obscure watchmaker in a provincial town. The gravestone had not been destroyed, and was restored in 1866." Let us hope future generations of clock and watchmakers will jealously guard this tribute to the worth of their fellow craftsmen against any further attempt at desecration.



FIG. 197.

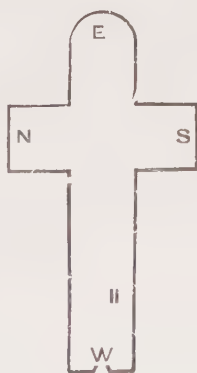


FIG. 198.

The position of the tomb is marked by the two parallel lines on the accompanying plan of the cathedral (Fig. 198). E is the altar floor; W the nave and western entrance; N, north transept; S, south transept and Poets' Corner.

This worthy contemporary of Tompion was born in 1649. I had a clock-watch by him, inscribed "Daniel Quare, St. Martin's le Grand, London."

From its construction, one could with tolerable certainty decide that it was made about 1676, and I am therefore inclined to think St. Martin's le Grand was his first business address. It is said he afterward carried on business at the "Plow and Harrow," in

Cornhill, but all the authentic records I have been able to consult refer to him from 1680 to the time of his death, as of the "King's Arms," Exchange Alley.

About 1680 he produced repeating watches of his own design, and when the Rev. Edward Barlow, in 1687, made application to patent a repeating device, Quare successfully opposed the monopoly sought for by his rival. In Quare's arrangement a single push on a pin projecting from the case near the pendant sufficed to sound the hour and the quarters, while Barlow's required a distinct action for each.

The king, after a trial of each of the repeating watches, gave the preference to that of Quare, which fact was notified in the *Gazette*. This watch was, in 1823, in the possession of Mr. John Stanton, of Benwell, near Newcastle-upon-Tyne, from whose description of it in the *Morning Chronicle* the following is taken. "The outer case, of 22-carat gold, is embossed with the king's head in a medallion. The dial is of gold, with black Roman numerals for the hours and figures for the minutes. In the centre is a piece of pierced work in gold upon blue steel, representing the letters J.R. R.J. combined so as to appear like an ornamental scroll, above which is the royal crown. The box is pierced with scroll-work intermixed with birds and flowers. About the joint is engraved a landscape. On the back of the box two circular lines are drawn, between which is the following inscription: '*James II. gloria Deo in excelsis sine pretio redimi mini malâ lege ablatum bno. Regi restituitur.*' The watch is considerably thicker than, but otherwise not much above, the common size."

Quare afterwards made another and more highly finished repeating watch for William III.; it appears probable that in this, as in all subsequent repeaters by Quare, the pendant was thrust in to set the mechanism in action, instead of having a separate pin in the edge of the case for the purpose.

In 1695 a patent for a portable weather-glass was granted to Daniel Quare.

There is in the British Museum a small lantern alarum clock of his make, which has, above the bell, a perforated dome surmounted by a handle for carrying. A fine bracket clock by him in Windsor Castle is shown in Fig. 199, and a little clock, six inches in height, illustrated in Fig. 200, is said to have been the favourite timekeeper of William III., and was brought to England by him. This also is at Windsor Castle.

As splendid specimens of Quare's later work may be mentioned one-year clocks, of which he made three or four. One of them is at Buckingham Palace and another at Hampton Court Palace. Twenty-two years ago one of them was in the possession of Mr. J. H. Arkwright, of Hampton Court, near Leominster, where it probably is still. Many stories have been told of the structure of this remarkable production, and in 1873 I obtained the following very precise details concerning it from Mr. Palmer, a clockmaker of Leominster. The hands are of steel, and blued; the hour hand, beautifully pierced, fits



FIG. 199.

tight on to the hour socket with asquare; the minute hand is pinned on to a square with a collet as usual; it has a counterpoise, and is not so elaborately pierced as the hour hand. The dial is of brass and silver, it is fourteen inches square, and is an excellent specimen of the old style of work. The centre is matted and gilt, the spandrels are also gilt, but left plain to show up the silver fretwork corner pieces. The hour circle is brass, silvered; it is divided into minutes on the outside and into quarters of hours on the inside. The name "Dan Quare" is engraved between the hour figures 7 and 6, and "London" is



FIG. 200.

engraved between the 6 and the 5. On the dial plate itself, and just below the figure 6, the name is again inscribed in full, "Daniel Quare, London." The numbers of the teeth of the wheels in the train are as follows :—

Great wheel	...	...	...	96 teeth.			
First "	...	...	...	96 "	pinion	12 leaves.	
Second "	...	...	...	90 "	"	10 "	
Centre "	...	...	...	60 "	"	10 "	
Third "	...	...	...	56 "	"	8 "	
Swing "	...	...	...	30 "	"	7 "	

The minute wheels have each 36 teeth, well shaped and very regular; the minute pinion has 6 leaves; the hour wheel has seventy-two teeth, and it is keyed on to the hour socket. The centre, third, and swing wheels are very small and light, the diameter of the last-named is $\frac{7}{8}$ in.; the pivots also are very small. These three pinion arbors are an inch shorter than the other arbors of the train, and are pivoted into a small false plate which is pinned by four small pillars on to the inside of the large pillar plate. The collets on which these three wheels are mounted are either brazed or driven on to the pinion arbors. The third and swing wheel pinions are thickest at the collet, and taper off with a gentle curve to the head of the pinion, thus giving the appearance of the greatest strength with least material. The frame plates and six pillars are no larger nor heavier than those of many a modern regulator, the plates are 7 in. by 5 in., and the length of the pillars is $2\frac{3}{4}$ in.; they are riveted into the back plate, and the front plate is kept on by pins. The pallets are of the original anchor form. The seconds pendulum has a lenticular bob, and altogether weighs 2 lbs. $1\frac{1}{2}$ oz. It is suspended from the same cock that carries the back pivot of the verge. The suspension spring is $2\frac{1}{2}$ in. long, narrow, and very thin. There is no degree plate, but a brass finger projecting from the base of the case is filed to an edge just below the pendulum, and serves to estimate the vibration (which is about 1° on each side of zero), and also to set the clock in beat when fixing it. The case is of oak, handsomely veneered with walnut.

The barrel has fourteen grooves. The clock weight and pulley weigh 81 lbs.; the fall is 4 ft. 6 in.; the length of the weight and pulley is 1 ft. 6 in., which, added to the fall, makes 6 ft., which is the distance from the bottom of the clock case up to the seat board; the weight is hung by a double line. The clock is still an excellent timekeeper.

On casting up the numbers of the train it will be found to go 403 days, 4 hours, and 24 minutes.

Now, I cannot help thinking this is a very extraordinary achievement. It is true that the pendulum is light, and that, unlike Tompion's clock at Bath, there are no other motions beyond the hour and minute hands, but for 81 lbs. $\times$ 4 ft. 6 in. to drive the clock for more than thirteen months seems almost incredible; still I believe the facts are as I have stated them. There is no doubt that everything was done that was possible to economise the force. The very small and light swing wheel, the balanced minute hand, and the small shortened arbors with extra fine pivots, all conduce to the end in view.

Quare's one year clock at Hampton Court Palace until 1898 had not been going for some years. In 1836 Vulliamy substituted a dead-beat escapement for the original one. At Marston House is a month clock by Quare, belonging to the Earl of Cork. Mr. W. T. Harkness has another calculated for the same period. Quare's dials were particularly good, as may be judged from the specimen on page 315.

Quare and Tompion are each credited with the invention of equation clocks, for showing the difference between mean and apparent time, which came into use about 1699.

Among other instances of Quare's genius may be mentioned a clock to show apparent solar time by suspending the pendulum from a lever which was actuated by an equation cam, so as to lengthen or shorten the pendulum each day as required.

By several writers Quare is credited with the invention of the concentric minute hand, but such indicators were in use long before his time, the hour hand being driven from the great wheel, and the minute hand from the centre arbor. Quare's improvement consisted in devising mechanism so that the hour and minute hands should be actuated together. The earliest form of this device is applied to the clock-watch which has been already referred to. At first sight there appears to be motion work of the kind now in general use, but an important variation is apparent on examination. Both of the hands are driven direct from the great wheel. A wheel and pinion corresponding to the minute wheel and nut fit on to a squared arbor projecting from the great wheel. The canon pinion runs loose on a stud in the centre of the watch, and on it is placed the hour wheel in the usual way. The wheel and pinion attached to the great wheel are of brass, and to allow the hands to be set they fit friction tight on to a steel boss which has a square hole to correspond with the end of the great wheel arbor. Attached

to the bottom face of the canon pinion is a snail for releasing the striking work every hour.

Under the arrangement in vogue before Quare's time by which each hand was driven independently of the other if the minute hand was set forward or backward, the hour hand would cease to correspond with it. As the canon pinion was mounted on a stud there was no necessity of having the second wheel of the train in the centre of the movement, and so the going train was continued to one side of the centre, leaving the other side for the striking work. The one advantage of the present arrangement of motion work over Quare's is that the minute hand now follows the motion of the centre pinion without shake, but in Quare's plan the position of the minute hand was not so absolute on account of the backlash of the motion wheels.

Quare was admitted as a brother of the Clockmakers' Company in 1671, and served as master in 1708. During the latter part of his career he took into partnership Edward Horseman, who had been apprenticed to him, and the business was carried on at the same address under the title of Quare and Horseman.

Reproduction of a selection from the enquiries respecting Quare's timekeepers may not be out of place. On page 141 is one which refers to an attempt to indicate minutes with the hour hand by dividing the circle into but six hours in order to obtain room for the minute marks :—

"Lost, between Firle and Shoram Ferry, in Sussex, a gold watch, made by D. Quare, in a black Shagreen Case with a Cypher J. C. Whoever brings it to Mr. Shelly, Goldsmith, in Panton Street, near the Haymarket, shall have 2 guineas reward" (*London Gazette*, May 16, 1691).

"Lost, April 25, a Gold Minute Pendulum Clock, the name on upper plate D. Quare, London, 726 engraven on it, and a Shagrine case. Whoever gives notice of it to Daniel Quare, Clockmaker, at the King's Arms in Exchange Alley, shall have 3 guineas reward; or if already bought, their money returned again with content" (*London Gazette*, May 26, 1692).

"Lost, on the road between Hungerford and Marlborough, a Gold Repeating Watch, made by Quare and Horseman, with an old Gold Chain, and several seals hanging to it. Whosoever will bring them to Mr. Horseman, at Mr. Quare's, in Exchange Alley, shall have 20 guineas reward and no questions asked" (*London Gazette*, August 9, 1718).

Daniel Quare died at Croydon in 1724, and was buried in the Quakers' ground at Bunhill Fields, Finsbury.

Fromanteel, also spelt "Fromantel," "Fromantil," **Fromanteel.** and "Fromenteele." Ahasuerus Fromanteel, *primus* of Dutch extraction, was a maker of steeple clocks at East Smithfield. In 1630 he was warned by the Blacksmiths' Company to bring in his certificate of seven years' service as apprentice. This he complied with, and was forthwith elected free of the company. On the incorporation of the clockmakers, he joined them. In 1656 he became restive under the somewhat inquisitorial proceedings of the court relating to his apprentices and the antecedents of his workmen, and for a long period in the history of the guild his name appears in petitions and other documents, expressing disapproval of the management of the company, or as being called to account for infraction of its rules, some of which, it must be confessed, could not fail to be exasperating to a man with an extensive business, as Fromanteel appears to have had.

A second Ahasuerus Fromanteel appears on the list as free of the Clockmakers' Company in 1655.

A third Ahasuerus Fromanteel was, in 1663, on completion of his apprenticeship with Simon Bartram, admitted as a member of the Clockmakers' Company.

In 1663 also, John Fromanteel, who had been apprenticed to Thomas Loomes, was admitted to the freedom.

Then Abraham, son of Ahasuerus Fromanteel, was elected in 1680.

In 1658 proceedings were taken against Ahasuerus Fromanteel and his son Louis for keeping more apprentices than the regulations of the company allowed, so that there was a fairly large family of the Fromanteels in the clock trade at that period, and most of them seem to have been connected in business.

Beyond their squabbles with the Clockmakers' Company, there is a celebrity attaching to them as being the first to introduce the pendulum into England, the assumption being that one of the family had seen or heard of Huygens' clock in Holland, and brought it over to his relatives. Their claim has been challenged on behalf of Richard Harris; and it has also been asserted that Dr. Hooke investigated the properties of the pendulum as a controller for timekeepers before Huygens applied it. However, there is evidence that the claim of the Fromanteels to its introduction from Holland, if not unanimously allowed, was accepted pretty generally at the time.

Under date November 1st, 1660, Evelyn, in his Diary, writes : "I went with some of my relations to Court to show them his Maj^{ties} cabinet and closet of rarities . . . Here I saw . . . amongst the clocks one that showed the rising and setting of the sun in Y^e Zodig, the sunn represented by a face and raies of gold upon an

azure skie, observing Y^e diurnal and annual motion rising and setting behind, and landscape of hills, the work of our famous Fromantel."

Again, under date April 1st, 1661, Evelyn records that he "dined with that great mathematician and vertuso Mr. Zulichem (Huygens) inventor of the pendule clock"; and on May 8th, "I returned by Fromantel's, the famous clockmaker, to see some pendules, Mr. Zulichem being with us."

The subjoined Fig. 201 represents a clock by Fromantelin the possession of Mr. Percy Webster, which seems to agree somewhat with the description of Evelyn. The signs of the zodiac are on a rotating disc and the alcove above probably contained a ball showing the phases and age of the moon.

Fig. 202 shows a hanging clock in an ebonised case, by

"A. Fromanteel, London," of a little later date, and for which I am indebted to Mr. Thomas Wyatt of Lower Clapton. The dial is of brass with a silvered band to contain the hour numerals, which are very small and formed each within a ring. The original hand is missing. There are three bells and five hammers, the hours and first, second and third quarters being sounded. The movement is



FIG. 201.

well made, with three trains, the back plate in one piece, the front arbors carried in three separate strips so that any of the trains may be removed separately. The pillars are square and on one is engraved the name of the maker as quoted: the plates are fastened by hooks which fit into slots cut in the pillars. Below the moon



FIG. 202.

are silvered rotating discs with figures on the edges to indicate the ages of the lunar and the calendar months.

The *Commonwealth Mercury* of Thursday, November 25th, 1668, contains the following advertisement:—

“There is lately a way found out for making clocks that go exact and keep equaller time than any now made without this regulator, examined and proved before his Highness the Lord Proctor, by such

doctors whose knowledge and learning is without exception, and are not subject to alter by change of weather, as others are, and may be made to go a week, a month, or a year, with once winding up, as well as those that are wound up every day, and keep time as well, and is very excellent for all house clocks that go either with springs or weights; and also steeple clocks that are most subject to change of weather. Made by Ahasuerus Fromanteel, who made the first that were in England. You may have them at his house on the Bank-side, in Mosses Alley, Southwark, and at the sign of the Mere Maid, in Lothbury, near Bartholomew Lane end, London."

Mosses Alley, or Moses Alley, was a passage leading from the northern end of Bankside, Southwark, to Maid Lane.

The Mermaid in Lothbury was for over a century a noted shop for clocks. In 1650 Thomas Loomes, who was associated with the eldest Fromanteel in his attacks on the government of the Clock-makers' Company, and to whom John Fromanteel was apprenticed, resided there, and, after the time of Loomes, it was occupied by John Fromanteel. He was clearly a first-rate clockmaker, as will be gathered from a description, by Mr. Percy Webster, of a long case clock of John Fromanteel's production:—"The style of the clock is from 1680 to 1690, and is distinguished by many ingenious contrivances and good work. The frame is large, having three trains, viz. going, striking, and ting-tang: the back plate is in one piece, but the top is composed of three separate plates, one for each train, held rigid by means of thirteen neatly turned pillars and two cross-braces. It has the old bolt and shutter maintaining power, and the escape wheel is no more than one inch in diameter, the pallets being recoil and very long in the arm, taking in nearly half the wheel. The pendulum is nearly eight feet long, reaching to the bottom of the case, and the regulating is effected by means of a large milled nut fixed above the pendulum cock, the spring rising and falling between chops in the same way as many modern English clocks. The striking at the hour is peculiar, there being four bells of different notes, the shape of Chinese gongs, and four hammers on one staff, consequently striking a chord at each blow. The fixing in case is firmly done by means of four shaped brass brackets gripping the two side cheeks of the case and screwed on the movement, thus dispensing with a seatboard. It has a ten-inch square dial, which has originally been water-gilded in the old style with cherub corners. The circle is silvered in the usual way, and on the plate below is engraved "Johannes Fromanteel, Londini

fecit." It is evidently one of the first with the concentric minute hand, as each division is numbered individually from one to sixty. The case is quaintly made of dark wood, with a number of small panels somewhat in the style of an old Dutch cabinet ; there are spiral pilars each side of the dial, and it is characterized throughout by great luxury of execution."

Robert Hooke was born at Freshwater, Isle of Wight, on July 18th, 1635. As a youth he resided with Dr. Bushby, head master of Westminster School. He entered Christ Church College, Oxford, in 1653, and there his genius soon attracted the notice of Dr. Wallis, whom he frequently assisted in his chemical operations. Dr. Wallis introduced Hooke to the Hon. Robert Boyle, who engaged him as an assistant in the mechanical and philosophical works he was then employed on.

Hooke took part in and wrote upon all the scientific questions of his time. Sir Isaac Newton styled him "The Considerer." On the institution of the Royal Society he became one of its fellows, was afterwards entrusted with the care of its Repository, and made Professor of Mechanics to that body. About the same period he was elected Professor of Geometry in Gresham College.

I have been unable to obtain any portrait of Hooke, but will quote the following description of him from Aubrey's "Lives of Eminent Men": "He is of middling stature, somewhat crooked, pale-faced, and his face but little belowe, but his head is lardge ; his eie is full and popping, and not quick ; a grey eie. He has a delicate head of haire, browne, and of an excellent moist curle. He is and ever was very temperate and moderate in dyet, &c. As he is of prodigious inventive head, so he is a person of great vertue and goodness."

He discovered that the resilience of a spring is proportional to the angle through which it has been wound, and propounded the whole theory in the sentence, "*Ut tensio sic vis*," meaning that the force is proportionate to the tension. He proposed to patent his discovery in 1660, and to quote his words, "Sir Robert Moray drew me up the form of a patent, the principal part whereof, viz. the description of the watch, is his own handwriting, which I have yet by me ; the discouragement I met with in the progress of this affair made me desist for that time."

Derham describes the earliest of Hooke's essays in this direction as a "tender straight spring, one end whereof played backward and forward with the ballance." It is stated that several watches were

made under Hooke's supervision at this period, and one of the first to which the balance spring was applied he is said to have presented to Dr. Wilkins, afterwards Bishop of Chester, about 1661.

It appears that Hooke then conceived it to be an advantage to have two balances coupled together, and had two double balance watches constructed. In the first, which had no balance spring, the escape wheel was placed in the centre of the movement with its teeth in a horizontal plane. There were two verges standing vertically on opposite sides of the wheel and connected with each other by means of toothed wheels of equal size ; each verge had one pallet and carried a balance at its upper end, one balance overlapping the other.

In the second watch the verge escapement was arranged in the ordinary way, the balance being mounted on a verge with two pallets ; on the verge was also a toothed wheel which engaged with another of the same size mounted on a stud, and the pipe of this wheel carried the second balance ; the toothed wheels being of small size one balance was placed a little higher than the other and overlapped it. Each balance was controlled by a balance spring.

However, Hooke turned his attention to other matters, and in January, 1673, Huygens addressed a letter to Henry Oldenburg, secretary of the Royal Society, in which he described as his invention the application of a spring to control the balance in watches. This aroused the wrath of Hooke, who accused Oldenburg of having divulged the discovery in his correspondence with Huygens. Hooke enlisted the interest of Charles II., and in a lecture, entitled "Potentia Restitutiva," etc., said, "His Majesty was pleased to see the experiment that made out this theory tried at Whitehall, as also my spring watch."

In 1660, Hooke devised a pendulum timekeeper for ascertaining the longitude at sea. This was tried in 1662, and he subsequently proposed a compensation pendulum in the form of a rhomboid, the outline being of steel and the long horizontal diagonal of brass. This form, being wider than it was long, was considered to be impracticable. Troughton afterwards constructed a pendulum in which the rod was a series of small rhomboids arranged to compensate on Hooke's plan.

Hooke devised the first wheel-cutting engine about 1670. Prior to that time the operation of forming the teeth was tedious and imperfect. Blanks for watch and clock wheels were placed in the

centre of a circular brass platform, having thereon concentric circles and radial lines corresponding to the various numbers of teeth in general use. An arm pivoted at the centre of the platform carried a hard point at its other extremity, by which the positions of the teeth were marked on the blanks. The spaces were then filed out. Hooke contrived a circular file and made the platform movable so that each part of the circumference of the wheel could be brought within the action of the file or cutter.

Hooke also invented the anchor escapement for clocks about 1675. Among his conceptions for a marine timekeeper was one with two balances geared together, the idea being to avoid the effect of external motion. It is stated that this timekeeper had an escapement resembling the duplex.

His investigations covered a very wide field of science, but his restless disposition rarely allowed him to steadily pursue any subject to a conclusion. No sooner was he satisfied of the feasibility of any project, than he left it, thus allowing others to perfect his inventions. On the death of Oldenburg in 1677 he was appointed secretary to the Royal Society, and by an order of the Society, he was requested to give a full description of all the instruments which he had contrived, but ill health prevented him from performing it. During the last year of his life he was almost helpless. He died at Gresham College, March 3rd, 1703, and was buried at St. Helen's Bishopsgate.

Christian Huygens.

This distinguished mathematician was born at the Hague in 1629. Early in life he devoted his attention to the principles on which timekeepers were constructed, and in 1657 presented to the States of Holland a clock controlled by a pendulum. He seems to have acquired the additional cognomen of Zulichem from the place of his birth, and is so referred to by Evelyn during a short visit he paid to England in 1661, as quoted in the account of Fromantil. In 1665 his reputation induced Louis XIV. to invite him to Paris, in order to found a Royal Academy of Sciences there, and in 1673 was published his folio work, "*Horologium Oscillatorium*," etc. from which the appended drawings of his clock are taken.

The upper part of the pendulum is a double cord hanging between two cycloidal cheeks, to give a cycloidal path to the bob. Fig. 204 gives a better idea of this device, which was no doubt of advantage with the long arcs required by the verge escapement. Another feature of Huygens' clock is the maintaining power. P (Fig. 205) is the driving weight, supported by an endless cord,

passing over the pulley D attached to the great wheel, and also over the pulley H, which is provided with ratchet teeth and pivoted to the inside of the clock case. The cord *m* is pulled down to wind the clock, and the ratchet wheel H then runs under its click. So that while winding, as in going, one-half of P minus one-half of *p* is driving the clock. The pulleys D and H are spiked to prevent slipping of the cord.

This ingenious maintaining power is to be found in many eighteenth century clocks. When applied to a clock with a striking train, the pulley with the ratchet is attached to the great

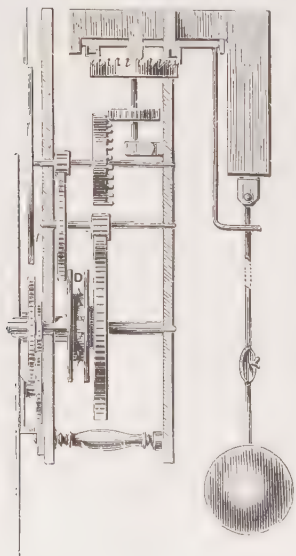


FIG. 203.



FIG. 204.



FIG. 205.

wheel of the striking part, one weight thus serving to drive both trains. A chain is preferable to a cord, owing to the dust which accumulates in the clock through the wearing of the latter. The drawback to the arrangement is that it is not suitable for clocks going for more than thirty hours between windings. It is, however, worth knowing that a thirty hour striking clock on this plan can be readily converted to an eight day non-striker by simply disconnecting the striking work.

Huygens devoted much attention to the production of a time-keeper for ascertaining the longitude; and finding the pendulum too unstable at sea, he in 1674 constructed a marine timekeeper

controlled by a balance and balance spring. The balance, instead of being on the verge, was on a separate staff, and driven by a wheel and pinion, so as to vibrate through very long arcs; and this necessitated the use of a very long balance spring. Huygens endeavoured to obtain a patent for the application of the balance spring, but in this he was successfully opposed by the Abbé Hauteville, who alleged a prior use of springs for the purpose. The marine timekeeper was not a complete success, for Huygens found himself baffled by the error in changes of temperature. He returned to Holland in 1681 and died there in 1695.

An exceedingly well-made clock, exactly corresponding to Huygens' drawing, is in the possession of Mr. Percy Webster. It bears the inscription, "Johanne Van Ceulen, fecit, Hagæ," and has a very handsome gilt skeleton dial, upheld by a figure of Time. This clock suggests the possibility of Huygens and Van Ceulen being associated in Holland as were Barlow and Tompion in England.

A watch by this maker, with a short train and without a balance spring, is shown on page 136. **Nathaniel Barrow.** Fig. 206 represents the exterior of a clock-watch with double pierced cases. A view of the movement

will be given further on.

Probably to get room for the striking work a most peculiar arrangement of the going train is adopted; the winding square of the fusee arbor projects within the rim of the balance, which has three arms clustered together in the form of a *fleur-de-lis* or trident head, so that a vibration of over half a turn is possible before the balance arms bank against the fusee arbor.



FIG. 206.—Clock-watch by Nathaniel Barrow (A S).

Three or four members of this family are known among the seventeenth century clockmakers. **Knibb.**

Samuel Knibb was admitted to the freedom of the Clockmakers' Company in 1663; Joseph Knibb in 1670; Peter Knibb in 1677. In the Guildhall Museum is a verge watch with curiously wrought pillars, made about 1690, by "John Knibb at Oxon."

Of these the most eminent maker was Joseph Knibb, mentioned

as of Oxon in the records of the Clockmakers' Company. In 1677 he made a clock for Windsor Castle, which Captain Smyth (*Archæologia*, vol. xxxiii.) speaks of as one of the earliest movements constructed with brass wheels. This statement may be correct if it refers to turret-clocks only, but it would not apply to smaller timekeepers. He issued a token, having on the obverse: "Joseph Knibb, Clockmaker in Oxon," and on the reverse "I.K.," with a clock face and hand. In the Camden Society's "Secret Services of Charles II. and James II." are various records of payments on behalf of King Charles. In the account up to July 3rd, 1682, is an item, paid "To Mr. Knibb by his said Ma'tie's comand upon a bill for Clockwork, £141." From about 1688 till nearly the end of the century he carried on business in London. His work was of the highest class, judging from the specimens I have had the opportunity of examining. A short time ago, Mr. Peake, of Wardour Street, had a square black case bracket clock by him of the type shown in Fig. 182 on page 171. It was fitted with a curious striking part, of the locking plate kind, but striking both hours and quarters from one pin-wheel, which had pins on both sides. The back-plate was engraved to an ornamental design, and on it was the inscription, "Joseph Knibb, Londini, fecit."

Messrs. Desbois, of High Holborn, recently had a long case clock, made by Joseph Knibb when he was in London. It was formerly in the collection of the Duke of Sussex, and therein described as having been the property of Charles II., when it was called a "drinking clock." The dial was square, of brass well gilt, with a skeleton silvered ring to receive the Roman hour numerals and a subsidiary silvered ring for the seconds. The centre of the dial was coarsely matted and every minute noted with Arabic figures. The corner pieces, boldly chased, were of the cherub-head pattern and the hands finely carved. A herring-bone border was engraved at the edge of the square, and altogether the dial presented a handsome appearance.

But the distinctive feature of the clock was the peculiar striking work, which was on the locking-plate principle. There were two bells, a large and a small one, and two corresponding hammers; also two sets of lifting pins, one on each side of the pin wheel, one set actuating the large and the other the small hammer. And the pins were arranged so that at I. o'clock one stroke was given on the small bell, at II. two strokes, at III. three strokes, at IV. one on the small followed by one on the large, at V. one on the large, at VI.

one on the large followed by one on the mall, at VII. one on the large, followed by two on the small bell, and so on. It will be noticed that so far, each stroke on the small bell stands for the Roman unit, and each stroke on the large bell for the Roman V. Perhaps the procedure through the 12 hours will be best shown by different sized dots to represent the bells as follows:—

I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII
•	•	•	•	•	•	•	•	•	•	•	•
	•	•	•		•	•	•	•	•	•	•
		•				•	•	•		•	•
							•				•

Among varieties of striking, this plan seems to have a distinct value, inasmuch as it materially economises the energy required for telling the round of hours, only 30 blows being required in place of the usual 78. This particular clock was arranged for a run of a month between successive windings.

When a few years ago it was proposed to alter the sub-division of the civil day by counting the hours continuously instead of duplicating them, whereby any possible confusion as to whether a particular hour meant A.M. or P.M. might be avoided, one of the difficulties presented to the minds of those who attached particular importance to a sound signal was the impracticability of counting so many strokes as would correspond to the hour as the day neared its close. But by adopting what perhaps may be called the Roman notation, as here shown to be practicable, even that reform may yet be approved of by the majority.

In the *London Gazette*, July 9-12, 1688, "a striking watch, two gold cases engraven, a brass case over them, Joseph Knibb, maker, day of the month, pins to feel the hours," was advertised for. "Information to be given to Mr. Jos. Knibb, at the Dial, in Fleet Street." There are other references to him, of which the following may be of interest:—

"Lost, on the 26th inst., near the Ferry Place, Putney, a gold Pendulum Chain Minute-watch, made by Joseph Knibb, of London, in a shagreen case, studded, with a Gold Knob, and marked with 48 on the inside of the case. Whoever will give notice of it to Mr. Joseph Knibb, watchmaker, in Fleet Street, shall have 2 guineas and charges; or if pawned or sold, their money again and a good gratuity" (*London Gazette*, April 30, May 4, 1691).

"Left in a coach or drop'd, the 12th inst., a Gold Out-Case of a striking watch, engraven. Whoever shall bring it to Joseph Knibb,

clockmaker, at the Dyal, near Sergeants-Inn, in Fleet Street, shall receive 40s. reward" (*London Gazette*, January 11-14, 1691).

"At the Clock Dyal, in Suffolk Street, near Charing Cross, on Friday, the 23rd inst., will begin the sale of a great Parcel of very good Pendulum Clocks, some do go a year, some a quarter of a year, some a month, some a week, and some 30 hours; some are Table Clocks, some repeat themselves, and some, by pulling repeat the hours and quarters; made and sold by Joseph Knibb, at his House at the Dyal, in Suffolk Street, aforementioned. There are also some watches to be then and there sold" (*London Gazette*, April 15-19, 1697).

**Thomas
Harrys.**

ST. DUNSTAN'S CLOCK.—Above the main entrance at the western end of the old church of St. Dunstan's in the West, in Fleet Street, were erected in 1671 two gilt clock dials, placed back to back, and mounted



FIG. 207.

in a handsome square case, with circular pediment, which projected well out over the footway, the tube containing the rod for actuating the hands being supported by a well-carved figure of Time. An alcove was built on the roof of the gateway, and within were large gaudily painted and gilt figures of Gog and Magog, which struck "ting

tang" quarters with clubs on two bells suspended above them. The clock and figures were designed and erected by Thomas Harrys, a clockmaker, then living at Water Lane, Blackfriars. Harrys submitted a statement of what he proposed to do, and after describing the "two figures of men with poleaxes to strike the quarters," continues, "I will do one thing more, which London shall not show the like; I will make two hands show the hours and minutes without the church, upon a double dial, which will be worth your observation, and to my credit." The figures of Gog and Magog proved to be a great attraction; they speedily became one of the sights of London, and their removal, in 1830, when the church was rebuilt, elicited many expressions of regret. Fig. 207, taken from an old print of the church in my possession, represents the clock as it was in 1737.

In 1830, when the old church was in course of demolition, the Marquis of Hertford bought for two hundred guineas the clock, the quarter figures, and three old statues representing King Lud and his sons.

The Marquis of Hertford was at that time building a residence at the north-west corner of Regent's Park. This he called St. Dunstan's Lodge, and in the grounds thereof the clock and accessories are still to be seen from Regent's Park. The dials are now in a circular case; but the movement, though it has of course undergone repair from time to time, is still, I believe, substantially the one Harrys supplied over two centuries ago.

Bradley. ST. PAUL'S CLOCK.—Langley Bradley was apprenticed to Joseph Wise in 1687, and admitted to the freedom of the Clockmakers' Company in 1694. Dr. Derham, in acknowledging technical information obtained from Bradley for the first edition of the "Artificial Clockmaker," published in 1696, speaks of him as an ingenious workman of Whitechapel; but during the greater part of his career he resided in Fenchurch Street. Watches by him with deep movements, very similar to Tompion's, will bear comparison with the works of that master. An exterior view of one is given in Fig. 208. In the Soane Museum is a calendar watch by him, which belonged to Sir Christopher Wren. It is a fine piece of work, and was probably made to the order of William III. for presentation to the architect of St. Paul's. The dial resembles Fig. 177, and the pillars are pierced to form the royal monogram W. M., surmounted by a crown. But Bradley seems to have devoted most attention to larger work, and is perhaps best known as the maker of the noted clock for St. Paul's Cathedral, which did good service from 1708

till 1892, and was generally regarded as the standard timekeeper of the metropolis till the giant dials and Big Ben at Westminster took the popular favour. The following particulars of the St. Paul's Clock, from notes I made shortly before it was taken down, will probably be of interest. The frame consisted of a cast-iron rectangular base plate, from which rose cast-iron columns supporting an entablature of the same metal. The going train occupied the centre of the space between the base and entablature, the wheels being arranged vertically; while the gun-metal bushes for the pivots were carried in wrought-iron straps bolted to the base plate and entablature. On one side of the going train was the quarter part, and on the other



FIG. 208.—Watch by Langley Bradley 1700
(A.S.).

side the hour-striking part, similarly arranged. All the wheels were of gun-metal, the great wheels being 2 ft. 8 in. in diameter, 1 in. pitch, and $1\frac{3}{4}$ in. wide. For the original recoil escapement was substituted a half-dead one in 1805, but with this exception it may be said that the whole of Bradley's mechanism remained in good working order till the clock was taken down. The two-second pendulum had a wooden rod and a cast-iron bob weighing nearly 180 lbs. The striking work was on the rack principle. The mitre wheels

for driving the dial works were commendably large, being 20 in. in diameter, and for supporting the dial end of the minute-hand arbor there were three friction wheels placed at equal distances apart round the outside of, and carried to the hour-hand tube. Slits were cut in the tube to allow a portion of the circumference of the friction wheels to enter, and the wheels were of such a size that they projected into the tube just sufficient to meet the minute-hand arbor. This ingenious contrivance is also applied to the Westminster clock, and is generally supposed to have been invented for it. Two sides of the St. Paul's clock tower, one facing down Ludgate Hill, and the other looking towards the south side of the churchyard, were utilized

for the dials of Bradley's timekeeper, black rings being painted on the stonework, on which the hour circles and the numerals were engraved and gilt. Each dial is a trifle over 17 ft. in diameter, and the central opening measures about 10 ft. 6 in., the hour numerals being about 2 ft. deep. Though but two sets of dial-work were used, the stonework of the four faces of the tower is alike, and on the eastern side, just visible from Cannon Street, although the dial was not painted, the hour numerals were cut in the stone; this suggests the inference that it was at one time intended to show the time there; it was probably found that the pediment over the southern entrance to the cathedral so obscured the view as to render the third dial comparatively useless. On the roof, just outside of this dial aperture, was a horizontal sun-dial, with a plate over 2 ft. in diameter, for the purpose of regulating the clock by the sun.

Bradley's bill appears in the Cathedral Accounts, December, 1708, as follows:—

To Langley Bradley, Clockmaker, viz^t:—

For a large Quarter clock, going 8 days, as by agreement, dated 15 Nov ^r , 1706	300	0	0
For 2 large Bellmetal Braces for the great bell, w ^t . 107 ^{lb} , at 14 ^d . per li	6	4	10
For a large strong canvas bed stuffe with oakam and sewed w th . strong thread line to receive the clock weight	2	5	0
	308	9	10

A curious feature is the description of the clock as an 8-day one, whereas, for many years at least, it was but a 30 hour one. Indeed, it seems doubtful if it ever went 8 days between windings, for by the arrangement of the train and barrel, the weight fell about 40 feet for 24 hours going.

From the clock room the upper part of the belfry is approached by a stone staircase formed in the wall of the tower itself, which is five feet thick, composed of two stone shells, with a space of fifteen inches between them. Here, forty feet from the clock floor, was hung the celebrated hour bell which, in addition to its primal duty of recording the hours, was tolled when the Sovereign, the Bishop of London, the Dean of St. Paul's, or the Lord Mayor of London passed away.

The commissioners appear to have had just as much trouble with

their hour bell as was afterwards experienced over the casting of Big Ben for the Houses of Parliament. In the year 1700, when the cathedral was approaching completion, they purchased, for 10*d.* a pound, from the churchwardens of St. Margaret's, Westminster, the celebrated Great Tom, which formerly hung in a clock tower facing Westminster Hall, as related at page 20, and which appears to have been given to the churchwardens by William III. They then entered into a contract with William Whiteman to recast the bell, and when the work was done the bell was temporarily hoisted into the north-west tower of St. Paul's and exhibited to the public, Whiteman being paid £509 19*s.* for his labour. But lo! after sustaining many blows for the delectation of the ears of the citizens, Great Tom the second exhibited a crack which rapidly developed, so that the bell was pronounced to be useless. The commissioners suggested that of course Whiteman would make good his work by recasting the bell. "Not so," rejoined Whiteman. "I delivered to you a sound bell for which I was paid, and since it has been in your possession it has been cracked." So to make the best of a bad job a very stringent agreement was entered into with another founder—Richard Phelps to wit. The accident with the first hour bell accounts for the difference between the date of the finishing of the 'clock and the time when the Phelps' hour bell was cast, around the waist of which is the inscription, "Richard Phelps made me, 1716." It is 6 ft. 9½ in. in diameter at the mouth, and according to Phelps' account, dated December 31st, 1716, weighs 99 cwt. 3 qrs. 7 lbs., of which 7 cwt. 2 qrs. 21 lbs. were new metal. For tolling it has a clapper weighing 180 lbs., and the total weight of the bell and fittings is, I believe, 5 tons 4 cwt. The hammer-head which struck the hours on the outside of the sound bow weighed 145 lbs. Just below the hour bell were two bells on which the "ting-tang" quarters were struck; the larger of these weighed 1 ton 4 cwt., and the smaller 12 cwt. 2 qrs. 9 lbs.

The first John Ellicott, watchmaker, whose parents
Ellicott. came to London from Bodmin, in Cornwall, was apprenticed to John Waters in 1687, admitted to the freedom of the Clockmakers' Company in 1696, elected on the Court of Assistants in 1726, and served as warden from 1731 till his death in 1733. He resided in the parish of Allhallows, London Wall. But the most eminent watch and clockmaker of the family was his son John Ellicott, born in 1706, who established himself in business about 1728 at Sweeting's Alley, which was situated just where the

statue of Rowland Hill now stands, near the Royal Exchange. After the fire which destroyed the old Royal Exchange in 1838, Sweeting's Alley was not rebuilt. He was elected a fellow of the Royal Society in 1738, being recommended for that honour by Sir Hans Sloane, Bart., Martin Ffolkes, John Senex, the celebrated globe maker, and John Hadley, the astronomer. At the meetings of the Royal Society he met James Ferguson, who afterwards frequently visited Ellicott's private house at St. John's, Hackney, where an observatory was fitted up, and various scientific experiments were made.

Ellicott was the inventor of a compensation pendulum in which the bob rests on the longer ends of two levers, of which the shorter ends are depressed by the superior expansion of a brass bar attached to the pendulum rod. In Fig. 209, *a* is the suspension spring; *s s s* screws for uniting the steel rod to the brass bar, slotted holes in the latter allowing it to move freely in answer to changes of temperature; *f f* the two levers pivoted to the steel rod; on the shorter ends rests the brass bar; the screws *g g* pass through the pendulum bob *C C*, and rest on the longer ends of the levers. By turning the screws their bearing on the levers may be adjusted. This device has not proved to be of much practical value, although there is a clock to which it is attached still going at the London Institution, Finsbury Circus.

Ellicott's productions were distinguished by excellent workmanship. He paid great attention to the cylinder escapement, and did much to bring it into use. In some of his later examples the cylinders were of ruby. His more costly watches were lavishly decorated, the cases in *repoussé*, and the dials enamelled on gold, some of these being really works of art. They are now rarely to be met with, for the iconoclastic dealer as a rule ruthlessly changes the dial for one of cheaper material. In reference to the prices Ellicott obtained, it may be mentioned that Horace Walpole, writing to Sir H. Mann at Florence, on June 8, 1729, with regard to a commission to purchase

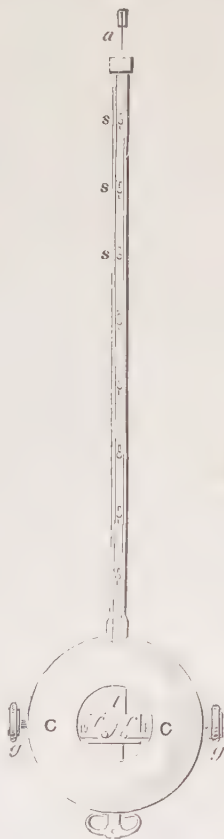


FIG. 209.

a watch, states that for one of Ellicott's the price was 150 guineas. In the British Museum is a silver repeater by him which belonged to Jeremy Bentham. Mr. Talfourd Ely, M.A., in the *Archæological Journal* for June, 1895, gives an interesting description of a watch by John Ellicott. It is in gold cases, the outer one decorated in *repoussé*, and appears to have been made in 1751.

Ellicott was on the council of the Royal Society for three years, and read several papers before the Society. They included one on

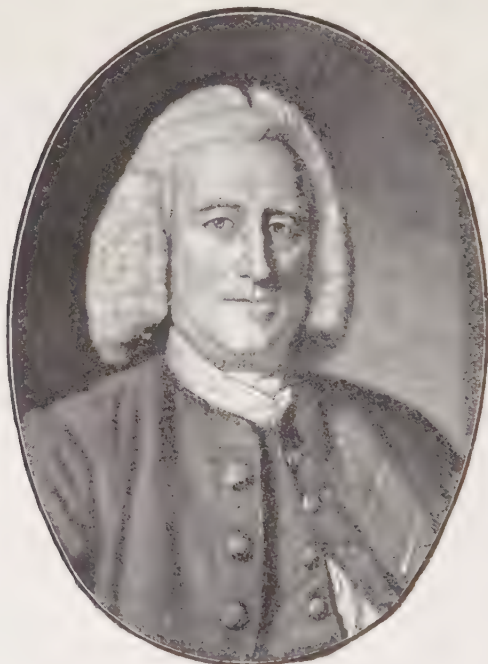


FIG. 210.—JOHN ELLICOTT, 1706—1772.

the "Influence which two Pendulum Clocks were observed to have on each other." The ball of each pendulum weighed above 23 lbs.; the cases were placed sideways to each other, so near that the pendulums when at rest were little more than two feet asunder. In less than two hours after they were set going, one of them, called No. 1, always stopped. As it had always kept going with great freedom before the other regulator, No. 2, was placed near it, Ellicott conceived its stopping must be owing to some influence the motion of one of the pendulums had upon the other; and upon watching

them narrowly, the motion of No. 2 was found to increase as No. 1 diminished. At the time No. 1 stopped, No. 2 described an arc of 5° , being nearly 2° more than it would have done if the other had not been near it, and more than it moved in a short time after the other pendulum came to rest. On this he stopped the pendulum of No. 2, and set No. 1 going, the pendulum describing as large an arc as the case would admit, viz. about 5° ; he presently found the pendulum of No. 2 begin to move, and the motion to increase gradually, till in 17 min. 40 sec. it described an arc of $2^{\circ} 10'$, at which the wheel discharging itself off the pallets the regulator went, the arcs of the vibrations continued to increase till, as in the former experiment, the pendulum moved 5° , the motion of the pendulum of No. 1 gradually decreasing as the other increased, and in 45 minutes it stopped. He then left the pendulum of No. 1 at rest, and set No. 2 going, making it also describe an arc of 5° ; it continued to vibrate less and less till it described but about 3° , in which arc it continued to move; the pendulum of No. 1 seemed but little affected by the motion of No. 2. Ellicott's explanation was that, as the pendulums were very heavy, either of them set going communicated a slight motion to the case and in a lesser degree to whatever the case touched. Ellicott's experiment was useful as showing the necessity of fixing clocks with heavy pendulums to the wall of a building or other ponderous and unyielding structure.

Ellicott designed several of our public clocks, amongst them that of the London Hospital, and was appointed clockmaker to the king. He died suddenly, in 1772, having dropped from his chair and instantly expired. The accompanying likeness (Fig. 210) is from a fine portrait of him shortly before his decease by Dance, afterwards Sir Nathaniel Dance Holland. John Ellicott was succeeded by his eldest son Edward, who had been in partnership with him since 1769. Edward Ellicott died at his residence in Great Queen Street, in 1791. The business was then carried on by his son Edward, who after serving in the subordinate offices, was elected as master of the Clockmakers' Company in 1834. Though brought up as a watchmaker he had but little liking for the business, and left the conduct of it in great measure to others. From Edward Ellicott and Sons the title of the firm was altered to Ellicott and Taylor in 1811, and to Ellicott and Smith in 1830. After the destruction of Sweeting's Alley, Ellicott and Smith removed to 27, Lombard Street, and remained there till 1842.

There was a third John Ellicott admitted to the freedom of the Clockmakers' Company by patrimony in 1792. He was the second son of the first Edward, but appears to have taken no part in the watch or clockmaking business. His grandson, Dr. Ellicott, is the present Bishop of Gloucester and Bristol.

This talented but unfortunate horologist was **Henry Sully**, apprenticed to Charles Gretton of Fleet Street in 1697. On the completion of his apprenticeship he travelled over the Continent, visiting Holland and Austria. From Vienna he went to Paris with the Duke d'Arenberg, where he made the acquaintance of Julien Le Roy, Law the noted Scottish speculator, and others. Le Roy at once recognized the genius of the young enthusiast who was imbued with ideas for perfecting time-keepers, and encouraged him to continue his researches. In 1717 Sully published "*Règle Artificielle du Temps*." The following year, commissioned by Law, he journeyed to London and engaged sixty watch and clockmakers, who, with their families, were located at Versailles, where a factory was started. After two years of unremitting toil Sully was displaced from the directorate, but a little later, under the protection of the Duke de Noailles, another factory was established at St. Germain. This lasted but a year, when Sully returned to England, bringing his staff of workpeople with him. The same ill fortune dogged his steps here, and in his extremity he returned to Paris, where for a time he sustained existence by repairing watches. When a little more prosperous, he, in 1721, turned his attention to the production of a marine timekeeper, and in 1724 presented it to the Academy of Sciences. This instrument had a modification of Debaufre's escapement, which Sully devised for the purpose, and a vertical balance which was really a pendulum. It carried cycloidal metal pieces, around which the upper end of a slender wire was wound, the lower end being attached to a lever with an adjustable weight, with the idea of keeping the vibrations of the balance isochronous. The pivots of the balance, instead of being in holes, were supported on the edges of large rollers, to diminish the friction, a device adopted afterwards by Mudge. In 1726 Sully published "*Abrégée d'une Horologe d'une Nouvelle Invention pour la Juste Mesure du Temps sur Mer*." When subjected to the tossing of the ocean, his timekeeper failed to yield the results anticipated from its performance on land. Though mortified by his failure, he again set himself to the solution of the problem. He had already made a marine watch with two balances geared

together, as designed by Dr. Hooke, and now proceeded with a new timekeeper of different construction ; but while engaged thereon he was seized with a serious illness, induced by over application and worry, and succumbed to inflammation of the lungs in 1728.

At the church of St. Sulpice, Paris, he had traced a meridian line on the pavement of the transept, and secured its permanence by inlaying a thin brass edge. He blocked up the south transept window except for a small hole in a metal plate at the upper part through which the rays of the sun cast a luminous disc about $10\frac{1}{2}$ inches in diameter on the floor. The disc moves across the line which at noon bisects it. In this church he was buried, and a fine obelisk of white marble erected to his memory in the north transept, in a position that allowed the meridian line to be carried up the face of the monument. A laudatory inscription recounted his services to horology, but the greater part of it was cut out by the revolutionists of 1793, who possibly resented the suggestion that French watchmakers could be indebted to a foreigner.

In the Guildhall Museum is a timekeeper with Sully's curious vertical balance. It is in the form of a bracket clock with a walnut bell-top case, has a seconds hand above the centre of the dial, and shows the days of the month through a slit below the centre. It is inscribed "Henricus Sully, invenit et fecit (1724), Horologer to the Duke of Orleans."

John Harrison.

John Harrison was born at Faulby or Wragby near Pontefract, Yorkshire, in 1693. He was the son of a carpenter, which business he followed for several years of his life. In 1700 the family removed to Barrow, in Lincolnshire. At a very early age John Harrison showed a great predilection for mechanical pursuits, and particularly directed his attention to the improvement of clocks.

One of his early efforts, with wheels and pinions of wood, which is in the possession of Mr. Evan Roberts, has John Harrison's signature with the date 1713 on the face of the day of the month wheel. Another long case clock by him is at the South Kensington Museum. Mr. Thos. Nicholson of Barton, Lincolnshire, has one made about 1730, and in the Guildhall Museum may be seen a very similar relic.

The offer, by Act of Parliament, of large sums for the production of a timekeeper sufficiently accurate to ascertain the longitude at sea, induced him to turn his attention to the subject. He devised a form of recoil escapement which required no lubrication at the

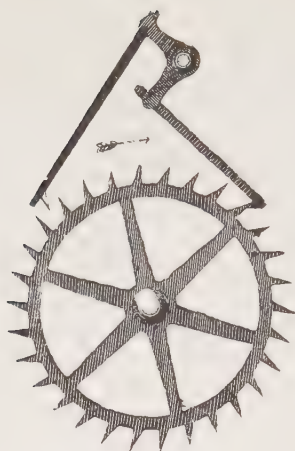


FIG. 211.

acting surfaces of the pallets, the arms being jointed and furnished with springs which flicked each one in turn out of the wheel as the pendulum reversed its swing. He also succeeded in constructing a pendulum in which the effects of heat and cold in lengthening and shortening the pendulum were neutralized by the use of two metals having different ratios of expansion. His escapement, generally called the "grasshopper," is shown in Fig. 211; it was of no practical value and need not be further described. His pendulum, known as the *gridiron* form of compensation, shown in Fig. 212, is still the form of compensation adopted in many foreign regulators. It is composed of nine parallel rods, five of steel and four of brass, the total length of each kind being nearly as 100 to 60, that being the ratio of expansion of the two metals. Depending from the cross frame A are two rods of steel *a a*. The frame B, to which they are fixed at their lower extremities *b b*, carries also two brass rods *c c*, which at their upper ends, *d d*, are carried in the frame C, together with two other steel rods *e e*. Those at the lower extremities *f f* are fastened in the frame D, which also carries the brass rods *g g*. The frame F carries the upper ends of this last pair of brass rods at *h h*, and also the central steel rod to which the bob is attached.

In 1728 Harrison journeyed to London, taking with him his pendulum, his escapement, and drawings of his proposed timekeeper, hoping to obtain the approbation and aid of the Board of Longitude. Before being submitted to the notice of that body they were inspected by Graham, whose maturer judgment prompted him to advise Harrison to first make the timekeeper, and then ascertain, from its actual going, what claims it might have to further notice.

Harrison continued plodding on in the country



FIG. 212.

repairing watches and clocks and making a variety of experiments till 1735; then, in his forty-second year, he came to London and took up his residence in Orange Street, Red Lion Square. He brought with him a timepiece he had invented and constructed. It was a cumbersome affair in a wooden frame, and had two balances. He obtained certificates of the excellence of this timekeeper from Halley, Graham, and others. On their recommendation he was allowed, in 1736, to proceed with it to Lisbon in a king's ship, and was enabled to correct the reckoning to within $1^{\circ} 30'$.

In consideration of this result, the Board of Longitude gave him £500 "to proceed with his improvements." It will be observed that the performance of his first timekeeper failed to attain the precision required by that Board; for had it determined the longitude to a degree, Harrison would have been entitled to £10,000 according to the provisions of the Act, as stated on page 238. In 1739 he finished another timekeeper, and afterwards a third, which was smaller and appeared to the members of the Royal Society to be more simple and less likely to be deranged than either of the preceding ones. In 1749 he received the gold medal which was annually awarded by the Royal Society to the most useful discovery, but he was still not satisfied with his productions. The experience gained by prolonged trial led him to abandon the heavy framing and wheels which characterized his earlier essays and to devise and construct his celebrated "watch" which eventually won for him the coveted reward.

He spent some time in improving and correcting his fourth nautical timekeeper, and then applied to the Commissioners of the Board of Longitude for a trial according to the Act of Parliament. This, after much delay, was granted, and his son William was in his stead allowed to take a voyage to Jamaica. William Harrison embarked in the *Deptford*, at Portsmouth, on November 18, 1761. After 18 days' navigation the vessel was supposed to be $13^{\circ} 50'$ west of Portsmouth by ordinary calculations, but by the watch was $15^{\circ} 19'$, and the timekeeper was at once condemned as useless. William Harrison, however, maintained that if Madeira were correctly marked on the chart, it would be seen on the following day; and in this he persisted so strongly, that the captain was induced to continue the same course, and accordingly the island was discovered the next day at seven o'clock. In like manner William Harrison was enabled by the watch to announce all the islands in the order in which they would fall in with them. When he arrived at Port

Royal, after a voyage of 61 days, the chronometer was found to be about nine seconds slow. On the 28th January, 1762, he set sail from Jamaica on board the *Merlin*, and on his return to Portsmouth, after an absence of five months, the chronometer had kept time within about one minute five seconds, which gives an error of 18 miles. This was much within the limits of the 30 miles prescribed by the Act of 1714; yet, several objections being raised, William

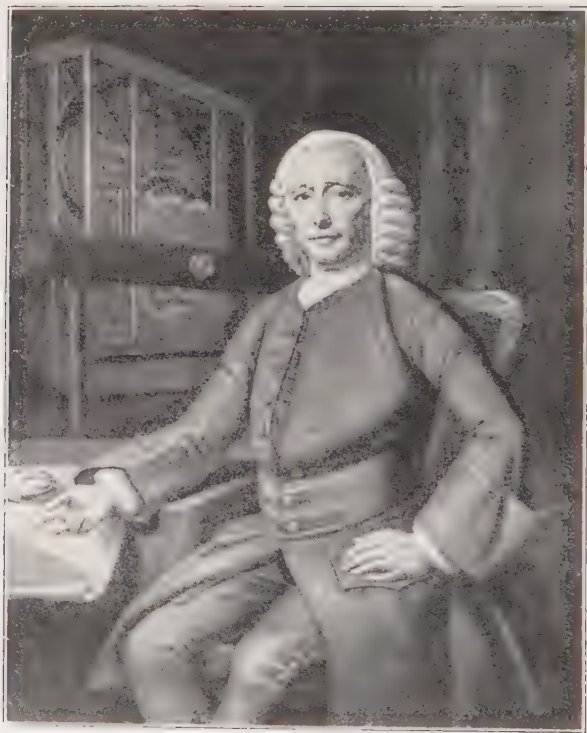


FIG. 212.—JOHN HARRISON, 1693-1776.

Harrison was obliged to undertake a second voyage, the proof from the first not being considered sufficiently decisive by the Board, although they advanced £5000 on account of the reward.

Accompanied by Dr. Maskelyne as the representative of the Board, William Harrison embarked in the man-of-war *Tartar*, on March 28, 1764, and arrived in Barbadoes on the 13th of May, when it was found the chronometer had gained 43 seconds; he set out for the return journey on board the *New Elizabeth* on the 4th

of June, and arrived at the Surrey Stairs on July 18th, when it was ascertained that after allowing for the estimated rate of one second a day gaining, there was an excess of 54 seconds for the whole period of 156 days. The result of this second voyage was so satisfactory, that the Board unanimously declared Harrison had really exceeded all expectations and demands of the Act of Parliament, and he was paid a further advance of £5000, with the condition that he explained the construction of his timekeeper. A sub-committee, consisting of Maskelyne, John Mitchell, Ludlam, Bird, Mudge, Mathews and Kendall, were appointed, and instructed to make themselves acquainted with the mechanism of the instrument. They reported themselves satisfied in 1765, but even then considerable delay occurred. Kendall was commissioned to make a duplicate of the chronometer, which appears to have taken three years to execute, for the date on Kendall's instrument is 1769, the year the final payment was made to Harrison.

Harrison's timekeeper is in the form of a large silver pair-case watch, with a centre seconds hand. It is not in gymbals, but reposed on a soft cushion, and on its trial voyages was carefully tended by William Harrison, who avoided position errors as far as possible by shifting the timekeeper to suit the *lie* of the ship.

The plates are 3·8 in. and the balance 2·2 in. in diameter; the fusee makes $6\frac{1}{4}$ turns. The escapement beats five times in a second. The pivot holes are jewelled with rubies.

One of the chief features is a bimetallic arm fixed at one end, and carrying at its free end two pins, to embrace the balance spring near its outer point of attachment. "The thermometer kurb is composed of two thin plates of brass and steel riveted together in several places, which, by the greater expansion of brass than steel by heat, and contraction by cold, becomes convex on the brass side in hot weather, and convex on the steel side in cold weather; whence, one end being fixed, the other end obtains a motion corresponding with the changes of heat and cold, and the two pins at this end, between which the balance spring passes, and which it touches alternately as the spring bends and unbends itself, will shorten or lengthen the spring."

Harrison at first provided additional curb pins for mean time adjustment, but had to abandon them; for it is clear, if they were placed behind the pins on the compensation curb, they would not act, and, if placed in front, the movement of the temperature pins would be ineffective.

It is, of course, easy to be wise after the event ; but, on examining the remontoire and escapement of Harrison's chronometer in the presence of the simple detent escapement introduced shortly after, it seems marvellous that he should have spent so many years over such complicated and by comparison inefficient contrivances. Harrison's drawings are most difficult to understand, but I venture to reproduce some contributed to the *Horological Journal* by Mr. H.

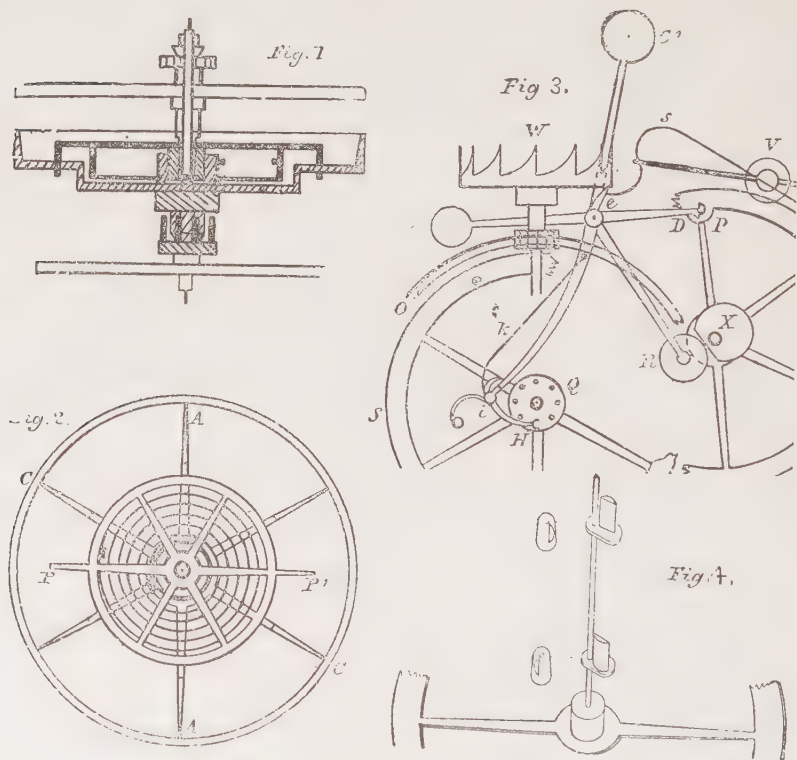


FIG. 214.—Harrison's remontoire escapement.

M. Frodsham, which were made from Kendall's duplicate of Harrison's timekeeper at the Greenwich Observatory.

Fig. 1 is a section through the fourth wheel. Fig. 2 a plan of the remontoire and contrate wheel. Fig. 3 a plan of the remontoire and escapement. The pinion at the top of Fig. 1 is driven by internal teeth on the third wheel of the train. The wheel immediately below the Pinion in Fig. 1 is the fourth wheel, which drives a pinion X (Fig. 3). The dished wheel below the fourth

wheel in Fig. 1 is the contrate wheel (C Figs. 2 and 3). In the recess of the contrate wheel is contained the remontoire spring which is wound eight times in a minute. The wheel at the bottom of Fig. 1 is the seconds wheel. This and the contrate wheel move continuously, while the fourth wheel and the other part of the train are locked by the lever D catching the stop P on the wheel P X, except during the winding of the remontoire. On the collet of the contrate wheel are eight pins, shown in Fig. 1, and at Q in Fig. 3. The eight pins in the contrate wheel in succession push the arm H (Fig. 3), and so unlock the train. The locking wheel P X drives a fly pinion and fly, V, to moderate the velocity with which the remontoire was wound. The seconds arbor is in the centre of the watch, and is driven by the seconds wheel below the contrate wheel. The projections P P' on the barrel of the remontoire are to prevent the remontoire running down.

Fig. 4 shows the pallets, which, instead of forming an angle of 95° or so, as is usual, are set parallel to each other, and in this way there is very little recoil, but increased tendency, to set. These acting surfaces of the pallets are diamonds set in brass collets.

During William Harrison's voyages, the rate of the watch could not of course be checked daily for want of some means of comparison, and so in May, 1766, the Board of Longitude placed the instrument at the Greenwich Observatory in the hands of Dr. Maskelyne, who had then been appointed Astronomer Royal, for the purpose of testing its daily rate. Dr. Maskelyne was supposed to favour lunar observations as a solution of the longitude problem and William Harrison considered he was prejudiced against the watch; it was therefore put in a box having a glazed lid and two locks the keys whereof were kept, one by Dr. Maskelyne and the other by Captain Baillie, governor of Greenwich hospital. The trial lasted 298 days, during which the watch gained 1 hour 10 minutes 27.5 seconds. Its greatest gain in one day was 30 seconds, the temperature being 60° and the pendant vertical; its greatest loss in one day was 6.5 seconds, the thermometer being at freezing point, the piece lying dial up.

Harrison's watch and the three bulky timepieces which preceded it are all preserved in the Greenwich Observatory.

On his tomb in the south-west corner of Hampstead churchyard is the following inscription:—

“In memory of Mr. John Harrison, late of Red Lion Square, London, inventor of the timekeeper for ascertaining the longitude at sea. He was born at Foulby, in the

county of York, and was the son of a builder at that place, who brought him up to the same profession. Before he attained the age of twenty-one, he, without any instruction, employed himself in cleaning and repairing clocks and watches, and made a few of the former, chiefly of wood. At the age of twenty-five he employed his whole time in chronometrical improvements.

"He was the inventor of the gridiron pendulum and the method of preventing the effects of heat and cold upon timekeepers by two bars fixed together; he introduced the secondary spring to keep them going while winding up; and was the inventor of most (or all) the improvements in clocks and watches during his time. In the year 1735 his first timekeeper was sent to Lisbon, and in 1764 his then much-improved fourth timekeeper having been sent to Barbadoes, the Commissioners of Longitude certified that it had determined the longitude within one-third of half a degree of a great circle, having not erred more than forty seconds in time. After sixty years' close application to the above pursuits, he departed this life on the 24th day of March, 1776, aged eighty-three. This tombstone was put up many years after his death."

In 1878 the tomb had become very dilapidated, the inscription being barely decipherable, and I then suggested to Mr. W. H. Prosser that he should obtain subscriptions, and have it restored. This he proceeded to do; but on applying to the Clockmakers' Company, some members of the Court expressed a wish that the matter should be placed in the hands of the Company, and the restoration was accordingly made under the direction of the Court forthwith. The engraving on page 218 is from one by S. Bellin, after a portrait by Sir M. A. Shee. His marine watch is at his right hand, and one of his early essays behind him.

Among the celebrated clock and watch makers of the last century must be reckoned Christopher Pinchbeck, known principally as the discoverer of an alloy of metals, called after him "Pinchbeck," and as an inventor of "Astronomico-Musical Clocks." In the *Dictionary of National Biography*, R.B.P. suggests that he probably sprang from the small town of Pinchbeck in Lincolnshire. He resided at Clerkenwell in a turning out of St. John's Lane called Albion Place, which, prior to 1822, when it was rebuilt, was known as St. George's Court. From here he removed to Fleet Street, as is shown by the following advertisement which appeared in *Applebee's Weekly Journal* on July 8th, 1721:—

"Notice is hereby given to Noblemen, Gentlemen, and Others, that Chr. Pinchbeck, Inventor and Maker of the famous Astronomico-Musical Clocks, is removed from St. George's Court, St. Jones's Lane, to the sign of the Astronomico-Musical Clock in Fleet Street near the Leg Tavern. He maketh and selleth Watches of all sorts and Clocks, as well for the exact Indication of Time only, as Astronomical, for showing the various Motions and Phenomena of planets and fixed stars, solving at sight several astronomical problems, besides all this a variety of Musical performances, and that to the greatest Nicety of Time and Tune with the usual graces: together with a wonderful imitation of several songs and Voices of an Aviary of Birds so natural that any who saw not the Instrument would be persuaded that it were in Reality what it only represents. He makes Musical Automata or Instruments of

themselves to play exceeding well on the Flute, Flageolet or Organ, Setts of Country dances, Minuets, figgs, and the Opera Tunes, or the most perfect imitation of the Aviary of Birds above mentioned, fit for the Diversion of those in places where a Musician is not at Hand. He makes also Organs performing of themselves Psalm Tunes with two, three, or more Voluntaries, very Convenient for Churches in remote Country Places where Organists cannot be had, or have sufficient Encouragement. And finally he mends Watches and Clocks in such sort that they will perform to an Exactness which possibly thro' a defect in finishing or other Accidents they formerly could not."

His reputation was world-wide, to judge from the appended extract from a letter of the period, quoted by W. J. Pinks :—

"Mr. P. has finished a fine musical clock, said to be a most exquisite piece of workmanship, and worth about £1500, wch is to be sent over to ye King of France (Lou's XIV.) and a fine organ to ye great Mogul, worth £300."

Pinchbeck exhibited his "astronomico-musical clocks," together with a variety of curious automata, at Bartholomew Fair, and the *Daily Journal* of August 27th, 1729, announces that the Prince and Princess of Wales went to Bartholomew Fair to see his exhibition. Pinchbeck also attended Southwark Fair, and with Fawkes, a celebrated juggler and conjurer of that day, had a united "show." This may shock many who avail themselves of the fine arts of advertising in vogue to-day : but, however undignified it may have been, it cannot detract from his ability as a horologist.

Mr. J. E. Hodgkin has a trade card, "Pinchbeck, senr., at Pinchbeck's Head in Fleet Street," a change of sign possibly induced by the popularity of Pinchbeck's name.

Pinchbeck gold was much used for watch cases and the like. It is an alloy of three parts of zinc to four of copper ; but its composition was jealously guarded by the inventor, as may be gathered from the following extract from a letter quoted by W. J. Pinks :—

"Mr. Xtopher Pinchbeck had a curious secret of new-invented metal wch so naturaly resembles gold (as not to be distinguished by the most experienced eye), in colour, smell, and ductibility. Ye secret is communicated to his son."

He died in 1732, at the age of sixty-two years, and was buried in St. Dunstan's Church, Fleet Street. The annexed portrait is from an engraving by Faber after a painting by Isaac Whood.

Edward Pinchbeck, eldest son of Christopher, who was born in 1713, succeeded his father in the business, as is evident from a "Caution to the Public" which he inserted in the *Daily Post* of July 9th, 1733.

"To prevent for the future the gross imposition that is daily put upon the publick by a great number of shopkeepers, hawkers, and pedlars, in and about this town, Notice is hereby given, that the ingenious Mr. Edward Pinchbeck, at the Musical Clock, in Fleet

Street, does not dispose of one grain of his curious metal, which so nearly resemble gold in colour, smell, and ductility, to any person whatsoever ; nor are the toys made of the said metal sold by any one person in England except himself." After recounting the various articles he makes from the alloy, the notice continues : "And in particular watches, plain and chased in so curious a manner as not to be distinguished by the nicest eye from real gold, and which are highly necessary for gentlemen and ladies when they

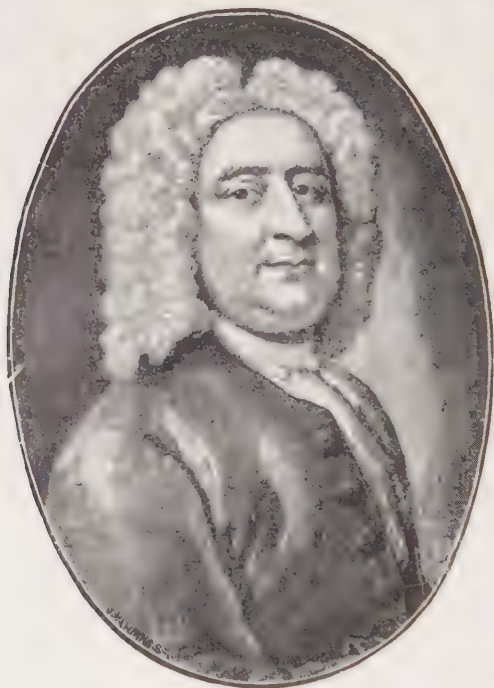


FIG. 215.—CHRISTOPHER PINCHBECK, 1670-1732.

travel, with several other fine pieces of workmanship of any sort made by the best hands. The said Mr. Pinchbeck likewise makes astronomical and musical clocks ; which new invented machines are so artfully contrived as to perform on several instruments great variety of musick composed by the most celebrated masters, with that exactitude, and in so beautiful a manner that scarce any hand can equal them. They likewise imitate the sweet harmony of birds to so great a perfection as not to be distinguished from nature itself. He also makes repeating and all other sorts of clocks and

watches ; particularly watches of a new invention, the mechanism of which is so simple, and the proportion so just, that come nearer truth than any others yet made."

Christopher Pinchbeck, second son of the first named Christopher, carried on a successful business as a clock and watch maker in Cockspur Street, being described as clockmaker to the king. In 1766 he is said to have bought from Ferdinand Berthoud, for George III., the first pocket watch made with a compensation curb. In 1781 he was elected as an honorary freeman of the Clockmakers' Company. He died at Cockspur Street in 1783, aged seventy-three, and was buried at St. Martin's-in-the-Fields.

A Richard Pinchbeck, "toyman," who seems to have carried on business 1760-70, was probably a member of the same family.

In the *Gentleman's Magazine* of June, 1765, it is stated that Pinchbeck and Norton had "just set up at the Queen's House a new complicated clock, having four dials, and amongst them it denoted clock and sun time, sunrise and setting for every day in the year in various places of the world, the Copernican motion of the planets, the ages and phases of the moon, high water at thirty-two different seaports, and the days of the week and the months of the year." Notwithstanding this announcement, it is very doubtful if Pinchbeck and Norton were ever in partnership. The probability is that each of them provided a clock, for there are still two astronomical clocks at Buckingham Palace, one by Christopher Pinchbeck the younger, and one by Eardley Norton. Each of these clocks has four dials, one on each face of the square case, and bearing a close resemblance to the dials on the old clock in the South Kensington Museum, which is represented on page 79. Pinchbeck's clock is the larger of the two, and has a handsome tortoiseshell case with silver spandrels at the corners of the dial.

Thomas Mudge.

Thomas Mudge, born at Exeter in 1715, was the son of a clergyman, who kept a school at Bideford. Young Mudge showed great taste for mechanics, and his father, noticing his extraordinary inclination

for horology, placed him, at the age of fourteen, as an apprentice with Graham. Mudge here made great and rapid progress in his art, and on the completion of his indentures took a leading position in the establishment. At Graham's death, in 1751, Mudge succeeded to the business. Shortly after this, King Ferdinand the Sixth, of Spain, ordered an equation watch from a well-known English watchmaker, who, in consequence of the difficulties

presented by this unusual construction, had recourse to Mudge. King Ferdinand was a lover of mechanical work, and hearing of this circumstance, sent an order direct to Mudge to construct for him any piece of horology which he thought the most curious, and to charge for it whatever he chose. In response Mudge constructed a watch which showed true and apparent time, struck the hours, and repeated not only the hours and quarters, but the minutes also. The king set great store by this piece of workmanship, for which



FIG. 216.—THOMAS MUDGE, 1715-1794.

Mudge charged him 480 guineas. About 1755 he entered into partnership with William Dutton, another apprentice of Graham.

Mudge invented the lever escapement about 1765, but it appears only constructed two watches on this principle: one for Queen Charlotte, which performed admirably, the other for his patron and friend Count Bruhl, which, after several journeys, subjected to all the inconveniences of changes of position and quick travelling, kept time within a few seconds during several weeks. Mudge showed the escapement to Berthoud, when he was in London in 1766, but

he did not think so favourably of it as Margetts, Emery, and other English horologists did.

In 1765 he published "Thoughts on the Means of Improving Watches, particularly those for Use at Sea." From this time his attention was mainly directed to marine timekeepers, and in 1771, leaving the conduct of the Fleet Street business to Dutton, he quitted London, and went to reside at Plymouth, where he devoted himself to the construction of chronometers. The first one was sent to Greenwich Observatory in 1774, and afterwards to Baron Zach (who was astronomer to the Duke of Gotha), and lastly to Admiral Campbell, who took it a voyage to Newfoundland, when its performance was pronounced to be satisfactory. The Board of Longitude sent him £500, requesting him to continue his researches. Two other chronometers were sent to the Greenwich Observatory for trial in 1779.

Dr. Maskelyne and Mudge could not agree. Maskelyne, who was Astronomer Royal, carried the Board of Longitude with him. It was asserted that chronometers by Arnold performed better than those of Mudge. Arnold had not submitted his chronometers for the Government reward, and therefore Mudge objected to the comparison. On the petition of Mudge, the House of Commons, in 1791, appointed as a committee to investigate the performance of Mudge's chronometers, the Bishop of St. David's, Mr. Atwood, Mr. De Luc, Mr. Ramsden, Mr. Edward Troughton, Mr. Holmes, Mr. Haley, and Mr. Howells, the last three being watchmakers of repute. After much bickering, Mudge, in 1793, was paid £2500, in addition to £500 he had already received as encouragement, although the Board of Longitude dissented from this course.

Mudge was often employed by George III. on delicate pieces of work, and on the death of G. Lindesay, in 1776, was appointed watchmaker to the king. He was made free of the Clockmakers' Company in 1738, and admitted to the livery in 1766. He died at his son's house in Walworth, on November 14th, 1794.

That an accomplished horologist and sound mechanic as Mudge seems to have been should, after his invention of the lever escapement, have persisted in the complication of a remontoire and vertical escapement for his marine timekeepers, must be ascribed to the perversity of genius.

The salient features of his chronometer are shown in the accompanying drawings. To obviate the difficulty of the compensating curb action interfering with the action of the regulating curb pins

there are two balance springs. The upper one for regulating has its stud C screwed to the balance cock, the stud D of the lower spring, with which the pins of the compensation curb engage, being fixed to the upper plate of the chronometer. There are two *remontoire* springs, H and I, which are wound by the escape wheel G, and which alternately impel the balance through the pins *a*, *b*, connected with the upper, and *e*, *f* with the lower one. The wheel and pallet actions will be understood from an examination of the

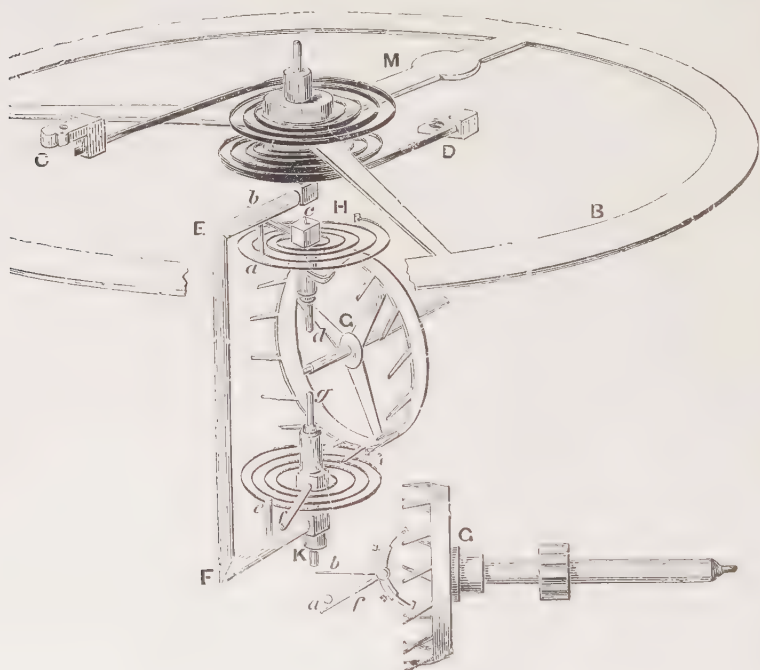


FIG. 217.—Mudge's remontoire.

lower figure, which is a plan. After the wheel tooth has given impulse to the pallet, and thereby wound the remontoire, it is locked on the projecting nib of the pallet till the balance in its excursion unlocks it, and allows the tooth on the opposite side of the wheel to impel the other pallet. The balance staff is cranked, and the pallets with the remontoires are pivoted partly in the balance staff and partly in separate cocks, so that there are six pivots moving from the balance staff centre.

After Mudge's migration to Plymouth, the Fleet Street business

seems to have reverted entirely to William Dutton, although the title of Mudge and Dutton was retained till 1794.

Thomas Mudge, junior, who was an attorney at 3, Old Square, Lincoln's Inn, engaged Messrs. Howells, Pennington, Pendleton, and Coleman, to produce chronometers on his father's plan; but they were too costly, and not successful. By 1799 the younger Mudge sold eleven at 150 guineas each, which did not pay him. Of others in course of manufacture some were finished by his co-adjutors, and some by Messrs. Barraud and Jamison. One of these instruments is in the Soane Museum, another at the Horological Institute, and another at the Guildhall Museum.

This famous horologist was born in 1736, at Bodmin, **John Arnold.** in Cornwall, where he was apprenticed to his father, a watchmaker. While a youth he left home, and after a stay of some time in Holland he determined to try his fortune in London. At first he worked as a journeyman, but soon found an opportunity of establishing himself at Devereux Court, Fleet Street. One of his earliest acts here was to make an exceedingly small half-quarter repeating watch, which he had set in a ring, and presented to his Majesty George III. in June, 1764. When it is stated that the whole movement measured but little more than one-third of an inch across, his ability as a fine workman and his marvellous sense of touch will be appreciated.¹ The escapement selected was a cylinder one, the cylinder, made of ruby and measuring one fifty-fourth of an inch in diameter, being the first one made of that material. The king accepted the repeater, and in return presented the clever watchmaker with five hundred guineas as an acknowledgment of his surpassing skill.

Arnold's achievement at once brought him into notice, and from that time his future success was assured.

It is said that the Emperor of Russia offered Arnold a thousand

¹ According to the *Annual Register* for 1764, the whole of this repeater, composed of 120 parts, weighed but 5 dwts 7 $\frac{3}{4}$ gr., the following being the weight of the principal items: The movement, complete, is 2 dwts. 2 $\frac{1}{2}$ gr.; great wheel and fusee, 2 $\frac{3}{4}$ gr.; second wheel and pinion, $\frac{3}{4}$ gr.; barrel and mainspring, 3 $\frac{1}{2}$ gr.; third wheel and pinion, $\frac{1}{2}$ gr.; fourth wheel and pinion, $\frac{1}{10}$ gr.; cylinder, wheel, and pinion, $\frac{1}{16}$ gr.; balance spring, cylinder, and collet, $\frac{3}{8}$ gr.; the balance spring, $\frac{3}{100}$ gr.; the chain, $\frac{1}{2}$ gr.; barrel and mainspring, 1 $\frac{3}{4}$ gr. great wheel and ratchet, 1 gr.; second wheel and pinion, $\frac{1}{2}$ gr.; third wheel and pinion, $\frac{1}{4}$ gr.; fourth wheel and pinion, $\frac{1}{8}$ gr.; fly-wheel and pinion, $\frac{1}{17}$ gr.; fly pinion, $\frac{1}{20}$ gr.; hour hammer, $\frac{1}{2}$ gr.; quarter hammer, $\frac{1}{2}$ gr.; rack, chain, and pulley, 1 $\frac{1}{4}$ gr.; quarter and half-quarter rack, $\frac{1}{2}$ gr.; the quarter and half-quarter snail and cannon pinion, $\frac{3}{8}$ gr.; the all-or-nothing piece, $\frac{1}{2}$ gr.; two motion wheels, 1 gr.; steel dial-plate with gold figures, 3 $\frac{1}{2}$ gr.; the hour snail and star, $\frac{1}{2}$ and $\frac{1}{16}$ gr.

guineas for a duplicate of the repeater made for George III., but the offer was declined, not that Arnold doubted his ability to produce it, but because he desired the miniature timekeeper to remain unique.

Arnold now turned his attention seriously to the problem which was engaging the thoughts of leading horologists here and in France. John Harrison had already fulfilled the conditions laid down by the Board of Longitude, and thus practically secured the £20,000 offered by Parliament in 1714 for a timekeeper sufficiently exact to ascertain the longitude within certain limits. A subsequent Act of Parliament, however, devoted a further £10,000 as a stimulus to continued research and improvement. Mudge was already in the field, and seemed bent on adhering to the remontoire principle somewhat on Harrison's plan. But it was clear to other minds that a nearer approach to perfection might be obtained by a chronometer of altogether a different character to the one invented by Harrison.

One of Arnold's first essays was a chronometer which Captain Cook took with him in the *Resolution* on his second voyage, in 1772. Two other timekeepers of Arnold's were on board the *Adventure*. Mr. J. U. Poole, who has examined these early examples, two of which are the property of the Royal Society, states that they have plain circular balances with flat balance springs acted on by a compensation curb; the escapements are a compound of the lever and the spring detent, and they beat half seconds, the workmanship being very rough compared with the finish exacted in the present day. It seems certain that a timekeeper of Larcum Kendal, which was also carried on the *Resolution*, performed better than those of Arnold did.

Arnold was not to be daunted. He profited by experience, and devised the helical form of balance spring, and a form of compensation balance. The spring, as shown in the sketch, is very similar to the one now in most general use for marine chronometers, but the balance was rather a complicated affair. These components he patented in 1775 (Patent No. 1113), and his specification describes compensation to be effected by a brass and steel volute fixed at its inner end to the collet of the balance, and actuating weighted rods by means of a lever attached to its outer end. Some years later he adopted the simple circular bimetallic-rim balance practically as now used, except that he soldered the brass



FIG. 218.

and steel together and formed the circular rim with pliers, whereas Earnshaw first turned a steel disc and then melted the brass on to its periphery in the way that has survived.

In May, 1782, Arnold patented his improved detent escapement (Patent No. 1328). This is practically the chronometer escapement of to-day, which was almost simultaneously invented by Thomas Earnshaw, except that in Arnold's escapement the escape wheel teeth, instead of being flat where they gave impulse, were epicycloidal curves, as shown in Fig. 219; but they required oiling, and were consequently abandoned. While Earnshaw's wheel is locked on the points of

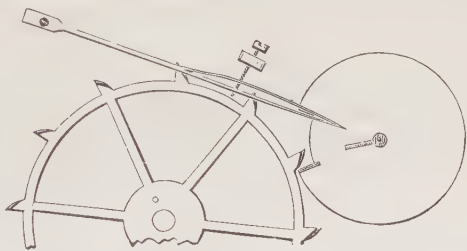


FIG. 219.

the teeth and the detent moves away from the centre of the wheel to unlock, Arnold's locked on the heel of the tooth and the detent moved towards the centre of the wheel to unlock, the sunk part of the body of the wheel allowing the locking stone to pass.

Arnold was now admitted to be a very successful chronometer maker, but he still continued his investigations, and made countless experiments with a view to improvements.

Some time after 1764 Arnold quitted Devereux Court for Adelphi Buildings, which is the address given in his patent specifications, and in an account of the going of a pocket chronometer, in 1781, it is stated to have been compared with the regulator at his house in the Adelphi. About 1785 he removed to 112, Cornhill, where he carried on business until his death, his son being admitted into partnership during the latter part of the time. Arnold and Son also had a chronometer manufactory at Chigwell in Essex.

In a book of "Certificates and Rates of Going," which he published in 1791, he gives the price of his large marine chronometers as from 60 to 80 guineas; pocket chronometers, in gold cases, 120 guineas, and in silver, 100 guineas; repeaters from 150 guineas for the best kind in gold, down to 25 guineas for the commonest, in silver cases.

The rival claims of Mudge, Arnold, and Earnshaw to the rewards offered for the best chronometer were submitted to a Select Committee of the House of Commons, assisted by a committee of experts, and eventually each was awarded £3000; but a moiety of Arnold's portion was not paid till after his death, when it was

received by his son. Arnold had not laid claim to the reward when depositing his chronometers at the Greenwich Observatory ; but their good performance was made use of by Maskelyne as a reason why Mudge's claim should not be recognized.

Arnold told the committee he had then made upwards of 900 timekeepers, but never two alike, so long as he saw room for any possible improvements ; adding, "I have twenty number ones."

According to Beillard, Arnold's son John Roger was apprenticed

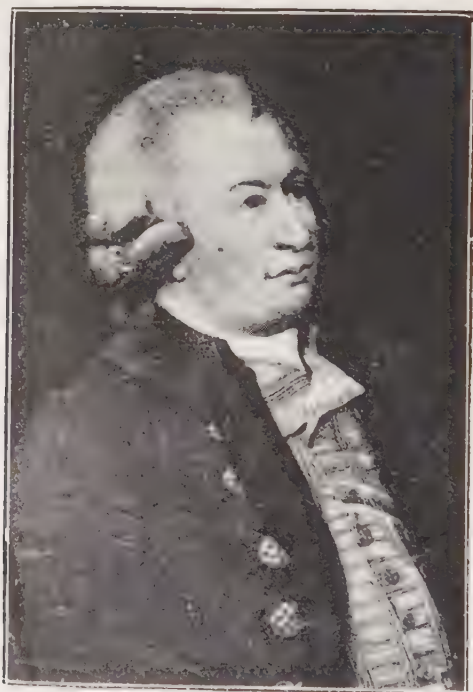


FIG. 220.—JOHN ARNOLD, 1736-1799.

in Paris to Breguet. Some time ago, by favour of Mr. Hurcomb, I examined a Tourbillon Chronometer in an engine-turned silver case, with square edges, which appears to have been the original model for the celebrated Tourbillon of Breguet on a chronometer by Arnold. The foot of the balance-cock was especially wide, and bore the following inscription :—"Premier régulateur à tourbillon de Breguet réuni à un des premiers ouvrages d'Arnold. Hommages de Breguet à la mémoire réveree d'Arnold offert à son fils. An 1808."

The workmanship throughout was splendid, and the graceful tribute to Arnold's genius of course enhanced the value of the piece.

John Arnold was admitted as a member of the Clockmakers' Company in 1783, and chosen on the livery 1796. He died at Well Hall, near Eltham, Kent, in 1799. The subjoined portrait is from an engraving by Susan Ester Reid, after a painting by R. Davy.

John Roger Arnold seemed to have inherited neither the horological ability nor the commercial aptitude of his father whom he succeeded. He was admitted to the Clockmakers' Company in 1796, and became master in 1817. In 1820 he removed from Cornhill to 27, Cecil Street, and from thence in, 1830, to 84, Strand, where he entered into a partnership agreement for ten years with E. J. Dent, and during this period the business flourished ; but immediately the term expired Dent set up for himself at 82, Strand, carrying with him the confidence of most of the customers of the late firm. John R. Arnold continued at 84, Strand, till 1843, when he died.

Thomas Earnshaw. To Thomas Earnshaw, who was born at Aston-under-Lyne in 1749, must be ascribed the merit of having devised the chronometer escapement and compensation balance precisely as they are now used.

The comparison of Arnold's and Earnshaw's escapement and balance just given in the sketch of the former's career may be referred to and need not be repeated.

That Earnshaw was a true horologist by intuition is evident. He is said to have been honest and straightforward, but somewhat rugged in his manner. There are, however, but few details of his life to be obtained. He was apprenticed to a watchmaker when fourteen years of age, and seems to have come to London immediately on completion of his indentures. After working for some time as a finisher of verge and cylinder watches, he taught himself watch jewellery and then cylinder-escapement making, using ruby cylinders and steel wheels. He married early in life, and the necessity of providing for a family out of his earnings seems to have hampered him considerably in carrying out his projects. There are, however, but few details of his life to be obtained.

To improve the chronometer escapement he, in 1781, conceived the idea of substituting a spring detent for the pivoted form as applied by Le Roy and other French artists. After showing the new method to John Brockbank, for whom he worked, he took it to Thomas Wright of the Poultry, another of his customers, and agreed that

when a watch with the device was finished, Wright should patent it. But the latter kept the watch for a year to observe its going, and did not obtain the patent till 1783. In the meantime John Arnold had lodged a Patent Specification claiming the same thing as his invention. To the end of his life Earnshaw lost no opportunity of declaring in raucous language his belief that John Brockbank had divulged his plan to Arnold. According to Earnshaw's



FIG. 221.—THOMAS EARNSHAW, 1749-1829.

account his actions were always marked by trusting simplicity though his confidence was continually betrayed. The patent cost Wright £100, and as all negotiations with Brockbanks, Haley, Hughes, Best and other leading watchmakers to purchase a share of it failed, watches with the new escapement were manufactured for various people on payment to Wright of a royalty of £1 each. The first dozen were not a success; the impulse roller being too small with relation to the escape wheel, they were liable to stop. Earnshaw discovered the

fault and with better proportions brought the new escapement into favour for pocket watches. The early ones were stamped [Wright's Patent] in small characters, a form of marking which was dropped when Earnshaw started in business for himself at 119, High Holborn, which appears to have been in 1795. His shop was one door east of the turning now called Southampton Row.

Dr. Maskelyne, the Astronomer Royal, having tried one of his watches in 1789, advised Earnshaw to apply to the Board of Longitude for permission to submit timekeepers for official trial at Greenwich Observatory. Five of his watches were tested there in 1791, and then he obtained an order for two chronometers, and these were deposited at the Observatory on January 1st, 1798.

The committee of investigation appointed to consider the claims of chronometer improvers awarded Earnshaw £500 in 1801 on account of his inventions, and in 1803 a further £2500, making his total reward £3000. Rightly or wrongly, he was of opinion that he was not well treated, and in 1808 issued "An appeal to the Public," declaring he was entitled to a more pre-eminent recognition.

Earnshaw also made a number of clocks. For the first one which was ordered by the Archbishop of Armagh, he was paid £150 and an additional £100 for going to Armagh to fix it.

He died at Chenies Street in 1829, but the business at Holborn was carried on for some years afterwards by his son.

ASCERTAINING THE LONGITUDE AT SEA. DEVELOPMENT AND USE OF THE MARINE CHRONOMETER.

The discovery of America, in 1497, caused some attention to be paid to the question of finding the longitude at sea, for it was evident that if ocean navigation was to be carried on with anything like safety, some more certain means of ascertaining the position of a ship than was possible by dead reckoning would have to be provided.

Columbus had not an azimuth compass, nor a sextant, nor a chronometer, nor a patent log, and he, and his immediate successors, were several months making the voyage across the Atlantic, while the early voyagers took about three years to circumnavigate the globe. Even in the middle of the last century Commodore Anson, in his celebrated voyage round the world, had no safe guide. When he

rounded Cape Horn he unexpectedly made the land on the western side, and found himself in consequence three hundred miles more to the east than he expected, and so his voyage was delayed. Then, again, he wanted to make the island of Juan Fernandez to recruit the crew. He got into the latitude of the island and thought he was to the west of it, but he was really to the east ; he ran eastward and made the mainland of America, and turned round and had to sail westward again before he got to the island.

With a sextant the latitude may be readily ascertained by measuring the altitude above the horizon of certain of the heavenly bodies and reducing the observations by reference to tables.

Finding the longitude is not so simple a matter, owing to the rotation of the earth on its axis, and the apparent change of places of the stars. As early as 1530 Gemma Frisius suggested solar observations and a timekeeper as a possible solution of the problem. The captain of a ship can readily ascertain the instant of noon at any place by observation of the sun, and so it is clear that if he had an instrument that could be depended on to show him the time at Greenwich or any other starting-point, the calculation of his longitude would be an easy one. But the most important adjunct, an accurate timekeeper, was wanting.

In 1598 the matter had risen to such importance that the King of Spain offered a reward of one hundred thousand crowns for any invention which should gain that object. The rulers of one or two other maritime states followed his example, but all without effect.

Early in the seventeenth century John Baptist Morin proposed the preparation of tables with a view of making lunar observations available. Although Morin's suggestion was ridiculed at the time, it has become a perfectly practicable method. The moon is nearer the earth than the stars, and consequently appears to occupy a different position with regard to them when viewed from different points on the surface of the globe. And as the moon moves so swiftly from night to night through the sky, she shifts her position with respect to the stars very rapidly. If the sailor be provided beforehand with a book giving the distances of the moon from certain fixed stars for certain hours of say Greenwich time on every day of the year, he can, in any position in which he may be, by observing the position of the moon, secure a datum from which the longitude may be deduced. But even after the position of the moon with relation to these fixed stars has been ascertained, and the voluminous tables provided, somewhat tedious calculations are necessary to reduce the

elements afforded by the observations obtained ; besides which, if the lunar method alone is relied on, there is the disadvantage that the moon is not always visible. However, Morin's suggestion led to nothing at the time, and the greater simplicity of solar observations induced most investigators to consider the possibility of providing a correct timekeeper. The first attempts to supply the want seems to have been made by Huygens and Hooke.

Huygens' marine clock, constructed about 1660, suspended in gymbals and actuated by a spring, was controlled by a pendulum. It was tried at sea by a Scottish captain named Holmes with but moderate success. A marine pendulum clock constructed under the direction of Dr. Hooke, was tried by Lord Kincardine in 1662, only to demonstrate the futility of relying on the pendulum as a regulator when tossed about in a ship on the ocean.

In the course of a paper he read before the Royal Society in 1662, Dr. Hooke said : " The Lord Kincardine did resolve to make some trial what might be done by carrying a pendulum clock to sea, for which end he contrived to make the watch to be moved by a spring instead of a weight, and then, making the case of the clock very heavy with lead, he suspended it underneath the deck of the ship by a ball and socket of brass, making the pendulum but short, namely, to vibrate half seconds ; and that he might be the better enabled to judge of the effect of it, he caused two of the same kind of pendulum clocks to be made, and suspended them both pretty near the middle of the vessel underneath the decks. This done, having first adjusted them to go equal to one another, and pretty near to the true time, he caused them first to move parallel to one another, that is, in the plane of the length of the ship, and afterwards he turned one to move in a plane at right angles with the former ; and in both these cases it was found by trials made at sea (at which I was present) that they would vary from one another, though not very much." Dr. Hooke concludes by saying that " they might be of very good use to the sea if some further contrivances about them were thought upon and put into practice."

In 1714 the British Parliament, on the recommendation of a commission, of which Sir Isaac Newton was a member, passed " an Act for providing public reward for such person or persons as shall discover the longitude at sea." This Act ordained " that any offered method or invention on this subject shall, in the first instance, be investigated by a specially selected body of practical men, who may then recommend it to the Royal Commissioners

constituting the Board of Longitude." The award was fixed at £10,000 for a method or invention to define on a voyage from England to any of the West India Islands and back the longitude within one degree, £15,000 to define the longitude within two-thirds of a degree, and £20,000 to within half a degree.

The Paris Academy of Sciences in 1720 offered a prize for the best description of a suitable timekeeper. This was won by Massy, a Dutch clockmaker. In 1721 Sully produced a clock which he laid before the Academy in 1724. It had a vertical balance, which from the description seems to have been a pendulum with cycloidal guides. This timekeeper promised success till tested in the open sea, when its performance, like that of the preceding instruments, was found to be unsatisfactory. Sully, however, seemed to be on the high-road to success, and he was engaged on another timekeeper just before his untimely decease.

In 1675 Greenwich Observatory was founded. Flamstead was instructed to rectify the tables of the motions of the heavens and the places of the fixed stars. He made a large star catalogue, and many observations on the moon and other bodies, and the results of his lunar observations were taken in hand by the philosophers of the time, Newton and others. The construction of lunar tables, and to predict the place of the moon with sufficient accuracy for the adoption of the lunar method of longitude, was a very serious task.

It was not until 1767 that Maskelyne, a succeeding Astronomer Royal, founded the "Nautical Almanac," and gave therein, for the first time in any country, distances of the moon from certain fixed stars, that the lunar method came into use. In the early part of the present century the reliability of the chronometer was established, and since then the chronometer method has gradually superseded the 'lunar.' In the "Nautical Almanac" the lunar distances are still retained, and circumstances occasionally arise when the mariner is glad to have recourse to them.

Stimulated by the prospect of obtaining the reward offered by the British Parliament, John Harrison, after thirty years of unremitting labours and vicissitudes, recounted in the sketch of his life (see pp. 115-121), fulfilled, in 1761, the conditions laid down by the Board of Longitude. Thoroughly as Harrison deserved the reward he so laboriously earned, it is curious to note that of all his inventions embodied in his timekeeper, the maintaining spring in the fusee is the only one that has survived.

Other Acts of Parliament relating to the subject were passed in 1741, 1753, and 1774. The last, repealing all former Acts, offered £5000 for a timekeeper determining the longitude to or within one degree; £7500 for determining the same to within 40 geographical miles; and £10,000 for a determination at or within half a degree. Further, to obtain the smallest portion of the reward, the error of the timekeeper was not to exceed more than four minutes in six months.

Mudge, the inventor of the lever escapement and an experienced horologist, with almost incredible infatuation, proceeded on the lines adopted by Harrison. Though he produced a superior instrument to Harrison's (see p. 219), he allowed Arnold (p. 231) and Earnshaw (p. 233) to develop the marine chronometer of to-day.

The investigations of Berthoud and Pierre Le Roy were nearly contemporaneous with those of Mudge, Arnold, and Earnshaw. Each of the French masters designed a detached escapement, and while Berthoud used a gridiron arrangement of brass and steel to compensate for temperature errors, and fitted his timekeeper with two balances geared together, Le Roy experimented with a balance composed of two mercurial thermometers, the bulbs being furthest from the centre of motion and the ends turned inwards. No one could question the ability of Berthoud and P. Le Roy, but in executing their respective conceptions the Englishmen showed superior judgment. The French marine timekeepers were by comparison very unwieldy, which may perhaps be traced to the influence of M. Daniel Bernoulli, an eminent mathematician, who, says P. Le Roy, "wishes marine watches to be as large as good clocks are commonly made, that the pieces may be worked with greater exactness, and that their defects, if there are any, may be more easily perceived. This is nearly what I have practised in the new marine watch." However, the simplicity of construction and the compactness of Arnold and Earnshaw's chronometers have ensured the general adoption of their models.

This noted family of clockmakers was of Swiss

Vulliamy. origin. Justin Vulliamy emigrated from Switzerland and settled in London about 1730. He became connected with Benjamin Gray, of Pall Mall, whose daughter he married, and with whom he subsequently entered into partnership. Watches of very fine quality, inscribed "Benj. Gray, Just. Vulliamy," are occasionally to be met with. A choice example fetched £120 15s., when the Hawkins collection was dispersed by

auction in 1897. The case of gold was enamelled in colours with figures in a garden, birds and flowers; the outer case was of gold and crystal, and had a diamond thumb-piece to press back the locking spring.

At Mr. Gray's death the business was carried on by Justin Vulliamy. Mr. Gray was appointed as clockmaker to George II., and the family of Vulliamy held the office of clockmaker to the



FIG. 222.—Clock by Justin Vulliamy, Windsor Castle.

reigning sovereign till the death of Benjamin Lewis Vulliamy in 1854.

Benjamin Vulliamy, the son of Justin, was much favoured and consulted by George III. on mechanical subjects, especially in connection with Kew Observatory, which was a hobby of the king.

Benjamin Lewis Vulliamy, born in 1780, was noted for the exactness and excellent finish of his work, in both clocks and watches. The

large clock at the old Post Office, St. Martin's-le-Grand, and one at Christ Church, Oxford, are among the public timekeepers by him. He took an active interest in the Clockmakers' Company, of which he was five times master between 1821 and 1848. In 1849 the Court presented him with a piece of plate in recognition of his services to the Company. He wrote several pamphlets on trade subjects. One of them, on the construction of the dead-beat escapement for

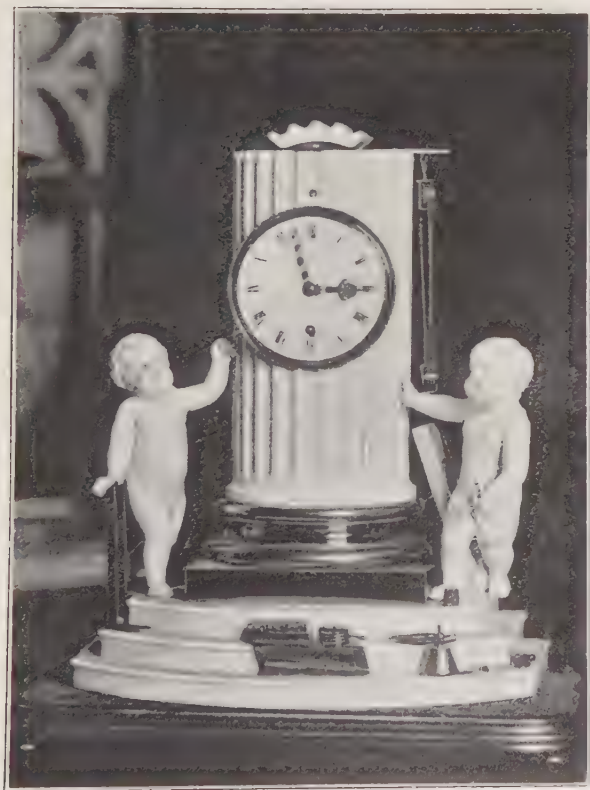


FIG. 223.

clocks, advocated the turning of the pallets for ensuring greater exactness.

Specimens of Vulliamy handiwork abound at the Royal Palaces, and in many instances clocks originally by other makers now contain Vulliamy movements either wholly or in part. All those we have illustrated are at Windsor Castle.

On the mantelpiece of the Queen's dining-room is a chiming

clock by Justin Vulliamy, in a plain blackwood broken arch case as shown in Fig. 222. It has a white enamel dial, and was chosen by Her Majesty for the situation by reason of its particular legibility. The subsidiary dials in the upper corners are for guidance in actuating the rise and fall of the pendulum and strike-silent hands.

A clock by Vulliamy in an uncommon and well-executed case of white marble, with two boys of biscuit china and particularly realistic building materials, is shown in Fig. 223.

The presence chamber contains a sumptuous mantelpiece of white marble, a magnificent piece of sculpture by J. Bacon, R.A.,

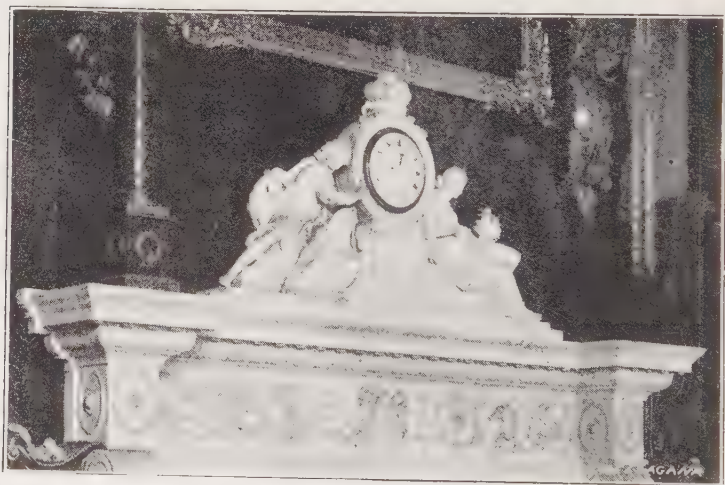


FIG. 224.

executed in 1790, and incorporating the clock case as seen in Fig. 224.

The clock is by Vulliamy, the fine enamelled dial slightly convex in form, measures about ten inches across. Under the clock is the inscription by Cowper :—

QUÆ LENTA ACCEDIT QUAM VELOX PRÆTERIT HORA
UT CAPIAS PATIENS ESTO SED ESTO VIGIL,

which Hayley happily rendered :—

“ Slow comes the hour, its passing speed how great !
Waiting to seize it—Vigilantly wait.”

In the Grand Reception-room is a clock with a movement by

Vulliamy and the peculiar case in the Chinese style shown in Fig. 225. This and the companion case which contains an aneroid barometer were made to the order of George IV. for the Pavilion at Brighton, and removed to Windsor on the accession of Queen Victoria.

On the landing by the Administration Offices of the Castle is the long-case clock by Vulliamy shown in Fig. 226. It is well made,

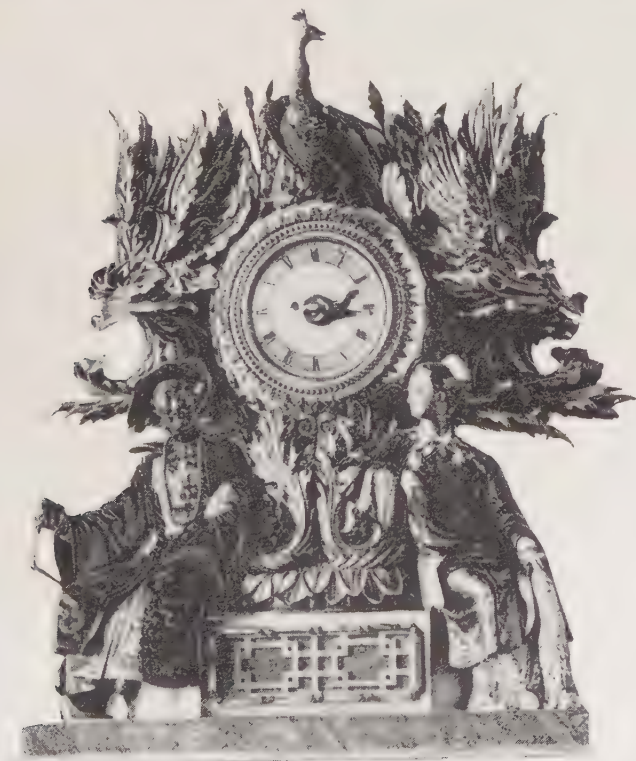


FIG. 225

with jewelled pallets, and is now used as a standard timekeeper. The dial is of enamel with gilt spandrels. The case though plain is of choice mahogany and has an effective appearance.

When the new Houses of Parliament were being built, the architect, Mr. Barry, applied to Mr. B. L. Vulliamy for information respecting the construction of the clock-tower, and this circumstance, together with Vulliamy's influential position in the horological

world, led people to think he would make the clock, as indeed it was intended by Barry and others that he should. But Vulliamy objected to the conditions laid down by Mr. Denison, who was commissioned by the Government to draw up a specification in conjunction with the Astronomer Royal, and, backed by the Clockmakers' Company, declared the stipulations to be too onerous and unnecessary. Vulliamy submitted drawings of what he considered the clock should be like, and this design Denison



FIG. 226



FIG. 227. — BENJAMIN LEWIS VULLIAMY.

ridiculed as being merely suited for a village clock of the old style, and quite unworthy of the national timekeeper. Denison's masterful attitude prevailed, and Vulliamy had to succumb, feeling, there is no doubt, the keenest mortification at being ousted from the proud position of leading clock-maker. It must be admitted that his talent lay rather in the perfection of details than

in comprehensive departures from the beaten track. He died in January, 1854. The appended portrait is from a miniature at the Horological Institute.

Justin Theodore Vulliamy, who was warden of the Clockmakers' Company from 1820 to 1822, appears to have had no other connection with the horological trades. He was, I believe, a brother of B. L. Vulliamy.

MUSICAL CLOCK

Charles Clay. BY HIM.—A remarkably hand-

some musical clock by Charles Clay, of Fenchurch Street, dating from about 1740, which stood for many years in a manor house in Suffolk, is shown in Fig. 228 by favour of Mr. P. Webster.

It is 8 feet 6 inches in height, the case being divided into two portions, the upper part of which is of amboyne wood relieved with heavy brass mounts well finished. In the arch of the dial are shown the age of the moon, the day of the month, and the following list of tunes played by the clock :—

“(1) Mr. Arceangelo Corelli's Twelfth Concerto, 1st Adagio, 2nd Allegro, 3rd Saraband, 4th Jigg.

“(2) The fuge in the overture of Ariadne.”

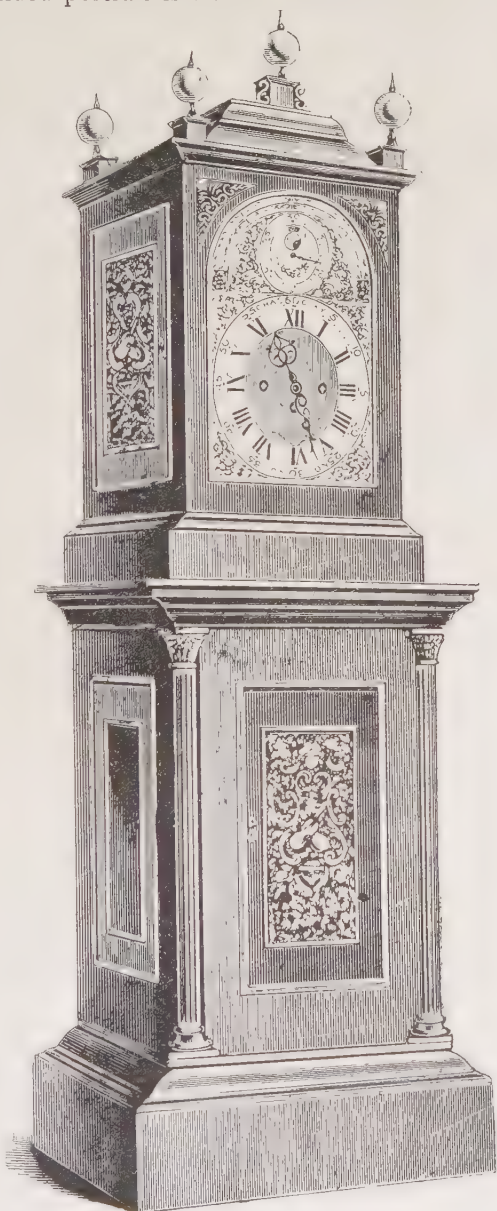


FIG. 228.—Musical clock by Charles Clay.

On the hour circle is engraved the maker's name, "Charles Clay, London."

The pedestal, which is of Spanish mahogany and amboyna wood, contains Clay's chiming machine with 21 bells. It is a fine piece of mechanism, driven by an ordinary chiming weight, though the barrel is fully 12 inches in diameter. Dampers are used to avoid vibration of the bells one with another, and by an ingenious contrivance the music starts immediately the clock finishes striking. The fly is attached to an endless screw, which ensures smooth running. Charles Clay came from an eminent family of horologists, and seems to have worthily sustained its reputation.

James Ferguson. James Ferguson was born at Keith, Banffshire, in 1710. He lived for some years at No. 4, Bolt Court, Fleet Street, where he died in 1776, and was buried in Marylebone churchyard. Among other conceptions of this celebrated astronomer and mechanician is the

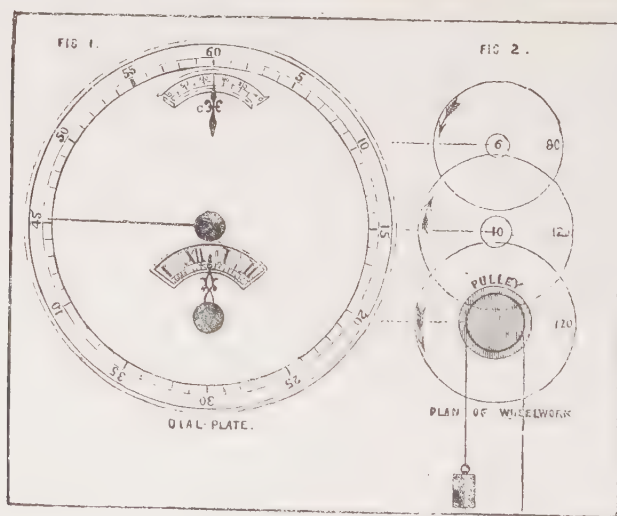


FIG. 220.

clock here shown, which is contrived with only three wheels and two pinions. The hours are engraved on a plate fitting friction-tight on the great wheel arbor; the minute hand is attached to the centre wheel arbor, and a thin plate divided into 240 equal parts is fitted on the escape wheel arbor, and shows the seconds through a slit in the dial. The clock has a seconds pendulum. The number of teeth in the escape wheel is higher than is desirable, and the

weight of the thin plate or ring in the escape wheel arbor is objectionable, though it might now be made of aluminium, vulcanite, or other very light material.

Ferguson also designed a curious and useful clock for showing the time of high and low water, the state of the tides at any time of the day, and the phases of the moon. The outer circle of the dial in the left-hand corner of Fig. 230 is divided into twice twelve hours, with halves and quarters, and the inner circle into 29.5 equal parts for showing the age of the moon, each day standing under the time of the moon coming to the meridian on that day. There are two hands on the end of the arbor coming through this dial, which go round in 29 days 12 hours 45 minutes, and these hands are set as

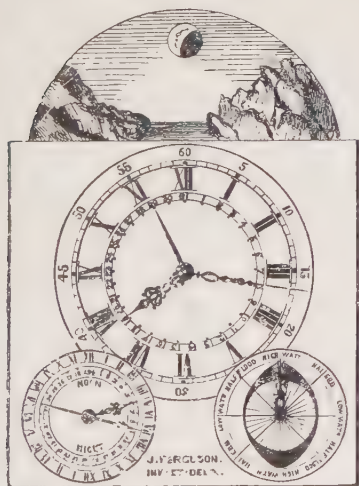


FIG. 230.

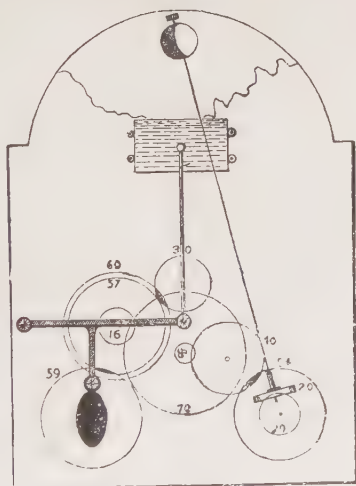


FIG. 231.

far apart as the time of high water at the place the clock is to serve differs from the time the moon comes to the meridian ; so that, by looking at this dial, one may see at what time the moon will be on the meridian and at what time it will be high water. On the dial, in the right-hand corner, all the different states of the tide are marked. The highest points on the shaded eclipse represent high, and the lowest, low water. The index travels round this dial in the time that the moon revolves from the meridian to the meridian again. In the arch above the dials a blue plate, to represent the sea, rises and falls as the tides do, and over this a ball, half black and half white, shows the phases of the moon.

The mechanism as it would appear at the back of the dial is shown in Fig. 231. A wheel of 30 fixed to the hour wheel on the centre arbor goes round once in twelve hours, and gears with a wheel of 60, on whose arbor a wheel of 57 drives a wheel of 59, the arbor of which carries the hand for the right-hand dial. On

this arbor is an elliptical cam which carries and lets down the tide plate twice in 24 hours 50.5 minutes. On the arbor of the wheel of 57 is a pinion of 16, driving a wheel of 70, on whose arbor is a pinion of 8 driving an idle wheel of 40. This idle wheel is merely to reverse the direction of the wheel of 54 with which it gears, and which carries the hands for the left-hand dial. The moon is driven from this last arbor by means of a pair of mitre wheels.

Henry Jenkins, who flourished from 1760 to 1780, first at

46, Cheapside, and afterwards at 68, Aldersgate Street, must be reckoned among the celebrated clock-makers of his time. Fig. 232 shows one of several astronomical clocks he contrived and produced. There are concentric second and minute hands, and among other motions are shown: equation of time, days of the month, age and phases of the moon, time of high water at



FIG. 232.

many seaports, the apparent motion of the fixed stars, motions of the planets, etc.

The lunar and other motions, except the revolution of the planets, are nearly as in Enderlin's clock, and need not be recapitulated. From the earth's diurnal motion wheel, rotating once in twenty-four hours, is driven a worm which carries forward an annual wheel, and the representation of the fixed stars one tooth each day. From thence is a communication to the planetary system dial above, and the motions of the planets are obtained by six wheels fixed together on one stud and driving six other wheels whose sockets are circles, and represent their respective orbits. On the stud are wheels of 108, 78, 84, 40, 8, 5, driving on sockets 26, 48, 84, 75, 95, 147.

The intense and abiding interest taken in the works

Abraham of this the predominant Continental horologist of **Louis Breguet**. his period, may be traced to the great variety of his conceptions and the exactness with which they were carried out. He seems to have had the faculty of surrounding himself with assistants who were good mechanics and able to embody his ideas to the best advantage. Clocks, chronometers and watches of his make all bore the stamp of originality in some particular. A defect in construction had only to be pointed out or the whim of a customer revealed, when Breguet was ready with the requirement. Of his more daring contrivances may be mentioned a "synchronizer" or clock for setting a watch right, a tourbillon or revolving carriage in which the escapement of a watch was placed so as to nullify the effect of change of position, which was one of the most perplexing problems of the adjuster; yielding bearing surfaces to the balance staff pivots of a watch, which he termed a "parachute," the object being to prevent damage to the pivots through shocks. He is said to have invented and made for Napoleon Buonaparte, a self-winding watch on the principle of the pedometer shown on page 355. He certainly made such watches, but as to the invention I am not sure that Recordon's patent in 1780 was not a prior disclosure of the device.

Of Breguet's writing no extracts can be given, for he published nothing; his works form the best tribute to his memory. Of these a few are selected for illustration.

Fig. 233 is a view of a clock and watch forming the "Synchronizer" This apparatus is the property of Her Majesty the Queen, and I am indebted for the illustration to Mr. H. M. Frodsham who, by permission, explained the mechanism in the *Horological Journal* some

time ago. As already stated, the object of the invention is to set the watch right. The clock is contained in a wooden case about ten inches high, with the four sides of glass. On the top are two crescent shaped clips to hold the watch. The clock may be regarded as a standard, and when the watch is placed in position, as shown, it is not only set to time at any desired hour, but if necessary the



FIG. 233.—Breguet's synchronizer.

regulator of the watch is also shifted. Projecting from the top of the clock is a pin which enters a small hole in the case of the watch and so establishes connection between the special pieces added to the two. There is an extra train of wheel in the watch to set the minute hand to zero, and this train is discharged by a snail-shaped cam in the clock. With this general statement I must be content; the details are most complicated, and to attempt anything like a clear description within a reasonable space would be hopeless.



FIG. 234 (A S).



FIG. 235 (A S).



FIG. 236 (A S).

Fig. 234 shows a watch with moving figures representing hammermen striking on bells, dating from about 1780. It is a good specimen, the whole of the chased work around the dial being unusually fine. Breguet may very possibly have been the inventor of this attachment. Figs. 235 and 236 show an interesting watch by Breguet, the dial proper is small, and in the arched space above is a picture of a warrior and scenery enamelled in colours.

Under a glass at the back of the case is a medal bearing the inscription, "L'ARMÉE FRANÇAISE A JENA EN 1806 A VENGE ROSBACH

DE 1757." It is surmised that this watch was presented by Napoleon Buona-
parte to an officer of the French army.

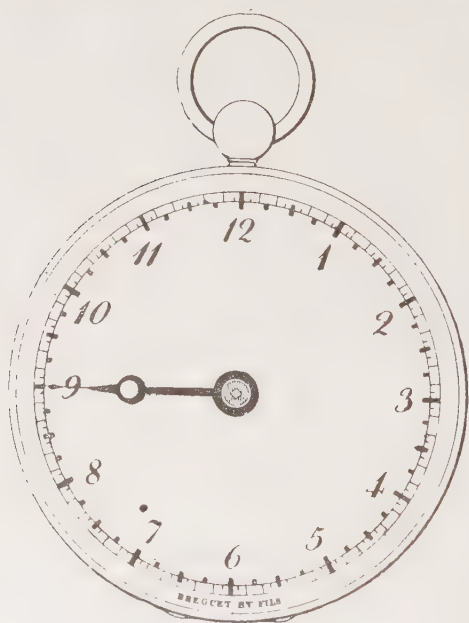


FIG. 237.—Breguet's "Subscription Watch."

The majority of Breguet's watches had very plain exteriors, the dials as a rule being either of silver or white enamel. As an example, one of his "*souscription*" watches is shown in Fig. 237. It was made in 1821, bears the inscription "Breguet et Fils," and cost £26. The bezels and bow are of gold and the body and back of the case are silver. It winds at the centre of the dial and has an hour hand only, though this is of peculiar construc-

tion, for beyond the part which indicates the hour is a fine prolongation to reach the sub-divisions, which are each a twelfth of an hour, equal to five minutes. With practice one could doubtless estimate the time very closely in this way. It is said that the subscription watches obtained their title from the combination of Breguet and certain of his workpeople to produce a reliable watch at a moderate price. Many of his watches had the signature *Breguet* scratched on the dial in script, the characters being so very tiny as to be almost indistinguishable without a magnifier. His early watches, it may be supposed, were not so marked, but I cannot ascertain when the

practice began. In some instances the number of the watch was on the pendant, but this again did not occur on all his watches.

Beillard quotes a letter from Breguet to the "Citoyen" minister of the Interior, asking for a patent for his escapement à Tourbillon, dated Paris le 18 Brumaire An IX. He was born at Neuchâtel, Switzerland, in 1747, his parents being of French origin. He settled in Paris in early manhood and quickly achieved success in business. Beillard relates that Marat,

who also came from Switzerland, and Breguet were intimately acquainted, and one night when they met at a friend's house in the rue Greneta, the populace under the windows shouted, "Down with Marat!" The situation becoming serious, Breguet dressed Marat up as an old woman and they left the house arm in arm. Some time after, when the guillotine was set up "*en permanence*," Marat, finding Breguet was in danger, gave him a pass to Switzerland. Breguet took a post chaise forthwith and reached Locle in safety. He afterward returned to Paris and died there in 1823, being succeeded in



FIG. 238.—ABRAHAM LOUIS BREGUET,
1747-1823.

business by his son Louis Antoine, who retired in 1833, and was followed by his son Louis, a worthy grandson of Abraham L. Although as an horologist Louis was overshadowed by the greatness of his grandsire, he established a reputation among electricians, as well as among horologists, and timekeepers issued from the house of Breguet during his administration were of the highest possible quality.

Equation Clock by Enderlin.

To meet the perplexity caused by the fact that sun-dials recorded true solar time and clocks mean solar time, as explained on p. 2, equation dials to indicate the difference each day were added in the latter part of the

seventeenth century. Figs. 239 and 240 are drawings of an early specimen by Enderlin, which gives, in addition to true and mean solar time, a perpetual day of the month, the sun's place in the zodiac, his rising and setting, and the moon's age and phases.

Fig. 239 is the dial work, and Fig. 240 the dial itself. In Fig. 239 the wheel Q, of 24 teeth, takes its motion from the striking part. It impels the wheel R, of 32 teeth, with a vertical arbor, which has a bend and compound joint T. This arbor has an endless screw,

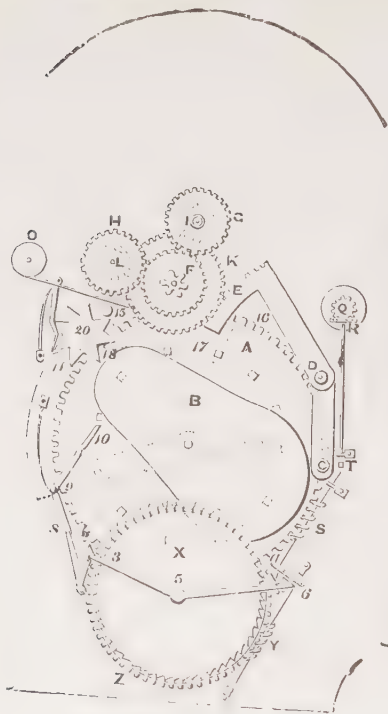


FIG. 239.

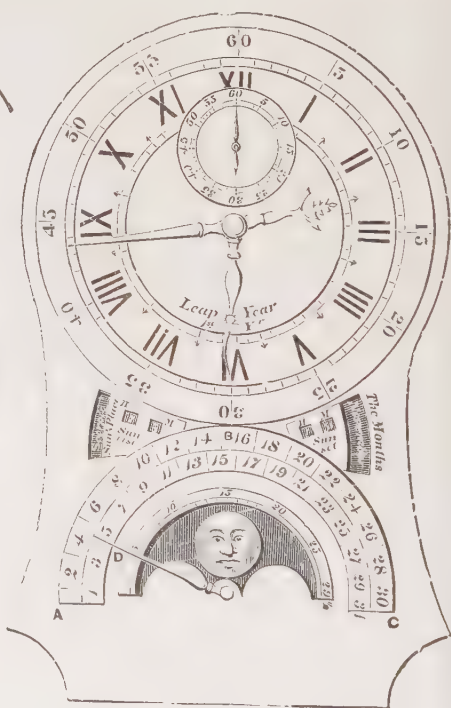


FIG. 240.

S, in the middle of the inclined half, turning a wheel A, of 487 teeth, and also a pinion *a*, of 24 leaves, actuating a wheel V, of 32 teeth. This last wheel revolves in 24 hours, *a* in 18 hours, and with it the arbor R T S *a*. Q revolves in 13 hours 30 minutes, and A in 8760 hours, or 365 days 6 hours, whence it is called the annual wheel. The wheel X, with 62 inclined teeth, and the wheel Z, with 90 teeth, revolve separately round one common centre 5, Z being in front. X is impelled by a tooth or pallet on the 24 hours arbor of the wheel V, and Z by an endless screw Y. This screw has a pinion 6,

of 21 leaves, upon its upper end, and, impelled by the pinion *a*, turns *Z* in 59 days 1 hour 30 minutes, being the sum of two lunations. The wheel *X* is impelled one tooth every 24 hours, therefore an entire revolution would be performed in 62 days; but it does not in fact make more than one-half of a revolution when it jumps back to its original situation.

Into the plane of the annual wheel *A* are inserted 12 pins, at such distances from each other in a circle as correspond to the number of days in each month, the January space being 31 parts out of 365, the February space 28 parts, and so on. On the centre of the annual wheel is also fixed a cam *B*, which varies its radius of curvature as required to suit the equation of time. Round the centre 5 is movable the lever 5, 6, with a claw at 6 and a tail 5, 3, resting on a pin in the click 28. A second lever, 10, has also its tail resting by a pin at 8 on the tailpiece of the click, while the end 10 falls in the way of the month pins in the annual wheel, being kept up to them by means of a spring acting near the centre of its motion. The pallet at *V* gathers up a tooth of *X* every 24 hours, and the click 2 lays hold of it when past and keeps it till next day. This goes on till one of the month pins, meeting the end of the lever 10, depresses it; at the same time the tail of this lever pushes, by its pin, the tail 3 of the click back and releases the wheel *X*. This, having a spring coiled round its centre, jumps back to the place at which it was at first, and the hand *D* (Fig. 240), being fast to the wheel, returns with it and recommences its motion from *A*. The month semi-circle is divided into two, and numbered alternately on the inner and outer arcs, to avoid crowding of the figures. At *D* is an arc divided into $29\frac{1}{2}$ equal parts. The interior part is cut away, showing the moon in full phase as painted on the wheel *Z*, of 90 teeth. Over the figure of the moon is an index, and both are repeated at the opposite diameter of the wheel, so that one appears at the first division as soon as the other disappears at the end. The face of the annual wheel has engraved upon it the sun's place in the ecliptic, the names of the months, and the time of the sun's rising and setting for each day. These appear through apertures of the dial, shown by the blackened spaces.

When the wheel *X* has returned to its original position, the pallet at *V* goes on; and when it has made half a revolution, it touches the end of the lever 6, and discharges the tail 3 from the click 2, which falls back into the teeth of the wheel *X*, to perform its office until again disengaged at the end of the month. The annual wheel

revolves in $365\frac{1}{4}$ days, therefore the fractional portion of a day will amount to unity every fourth year, and it will then be required that February should have 29 days. This is effected by a piece of brass 15, 16, 17, 18, shown by dots, being hidden behind the annual wheel. It is movable on the point 15, and has marked on the concealed flat part the four years successively—leap year, and the first, second, and third after, which are brought yearly in succession to an aperture in the dial above VI. in Fig. 240. This is effected by the star 20 with eight annular points. Two of these points are carried forward by pins in the annual wheel, one on the night of the last day in December, and the other on that of the last day in February. The star is kept in its place by the click or leg. A snail of four steps is fastened to the star, and regulates the position of the piece 15, 16, 17, 18, by supporting the end 18; thus the number 1, 2, 3, or leap year, will appear in the dial according as step 1, step 2, step 3, is presented to the projection 18 of the plate having the four years marked on its face. The piece 11 is movable on the centre of the annual wheel with a spring, pressing it so as to make it rest on a second snail behind the star. The lever 10 is pivoted to this rack, and is thus made to meet the pins, or recede from them, a space corresponding to one day, or more if required. The concealed snail, having a contrary spiral, removes the lever at the last day in February so far from the corresponding pin in the annual wheel that the hand D arrives at the 29th day before it is released, thus giving February 29 days once in four years.

The Equation Movement.—On the point D, in Fig. 239, the rack E moves its tail *e*, resting on the circumference of the equation curve. At *o* is a box with a spring, which keeps the cord 15 always stretched. This cord surrounds a pulley on the plane of a concealed wheel N, under K, but not attached to it. This wheel acts into the rack which is always resting on the equation curve. The pinion I, of 30 teeth, revolving in 60 minutes and carrying the minute hand, turns the wheel K, of 60, which drives a pinion L, of 30, also in 60 minutes. To L is attached a wheel II, of 48 teeth, which turns a similar wheel F, and this again a third similar wheel G, the tube of which surrounds the arbor of I, and carries the equation hand with a little sun on it pointing to 30, in Fig. 240. The wheel N, below K, is pinned to a bar, which is not seen, but which carries the wheel H and pinion L; and as the teeth of the rack are acting in the wheel N, the concealed bar moves alternately towards I and 15 as the radius of the equation cam varies. This motion makes the pinion L some-

times advance and sometimes retrograde a few teeth, independently of the motion it receives from the rotation of K ; and this additional motion is also communicated to the wheel H in consequence of its connection with L, and hence to both F and G, the latter bearing the equation hand.

Altogether this is an interesting example of the mechanism of early complicated clocks. The perpetual calendar work is now done with more simplicity, in cases where such devices are demanded, and the equation indicator of Tompion's Bath clock, of which a description is also given, is actuated in a more direct way, as may be seen from comparison.

In 1727 William Hogarth, the eminent satirical artist, published a curious print called "The Masquerade Ticket." On the top of it was shown a clock dial like Fig. 241, which was thus described in John Ireland's "Hogarth Illustrated," where it was also repre-

Curious Dial by Hogarth.

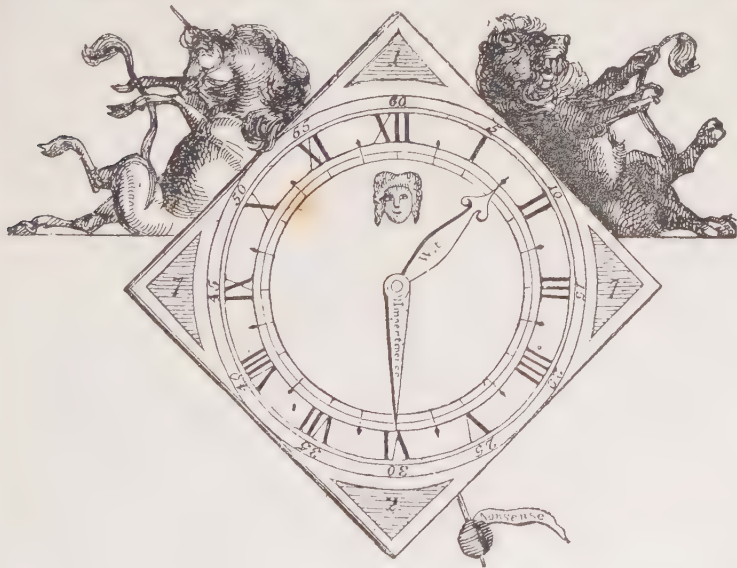


FIG. 241.

ented : "The head of the renowned Heidegger, master of the mysteries and manager in chief, is placed on the front of a large dial, fixed, lozenge fashion, at the top of the point, and, I believe, intended to vibrate with the pendulum, the ball of which hangs beneath, and is labelled Nonsense. On the minute finger is written Impertinence, and on the hour hand Wit ; which seems to intimate,

nonsense every second, impertinence every minute, and wit only once an hour ! 1727, the date of the year this print was published, is on the corners of the clock. Recumbent on the upper line of the print, and resting against the sides of the dial, the artist has placed our British lion and unicorn, lying on their backs, and each of them playing with its own tail. The lion sinister, and the unicorn dexter ; the supporters of our regal arms being thus ludicrously introduced, probably as a sly reminder of the encouragement King George II. gave Heidegger, who, by superintending the pleasures of our nobles, gained an income of £5000 a year.

**Green's
Lichfield
Clock.**

In the *Universal Magazine* for 1748 is illustrated a singular clock with a peculiar outer case, about four feet high, built in three tiers, and shown on p. 259. The early history of the clock does not appear to be known, but at the date quoted it belonged to

Mr. Richard Green, of Lichfield.

On the lowest section and under a cornice are two tables of brass, plated with silver, containing the Decalogue. Above, in a niche, stands a crucifix of pearl, studded with crystals set in silver. In a square compartment on one side of the tables is engraved, on a plate of brass, the Lord's Prayer, and on the other side the Creed, both of which, as well as the Commandments, are in Latin. On a panel between each plate is a festoon of fruit and flowers, over which, on each side, is seen a cherub, with several other ornaments, neatly gilt.

Above this cornice, and immediately in front, is the face of the clock, which shows the day of the month, day of the week, hour of the day, and age of the moon. In a niche on each side of the dial is placed a brass statue, gilt ; that on the right of St. John the Evangelist, on the left, of St. Peter. In the middle of the second cornice, and over the dial, stands a cock, alluding to St. Peter's denying his Master.

The upper part represents a stately pavilion, adorned with four angels, cherubim, vases, etc., supported by pilasters of the Tuscan order, and terminating at the top in a lofty pinnacle, upon which stands a brazen statue of Fame with wings expanded, holding a trumpet in each hand. Within the pavilion, in the centre, appears Pontius Pilate, having a basin of water before him, as washing his hands ; and round him move continually three images, representing our Saviour as going to His crucifixion, the Virgin Mary, and Simon the Cyrenian bearing the cross.

These three last-mentioned figures make one entire revolution every minute.

The musical part of this clock executed eight different tunes, any one of which it played several times over every three hours, with provision also to play it occasionally.

The outward case of this horological machine occupies the left of the engraving. It represents a high finished tower steeple of

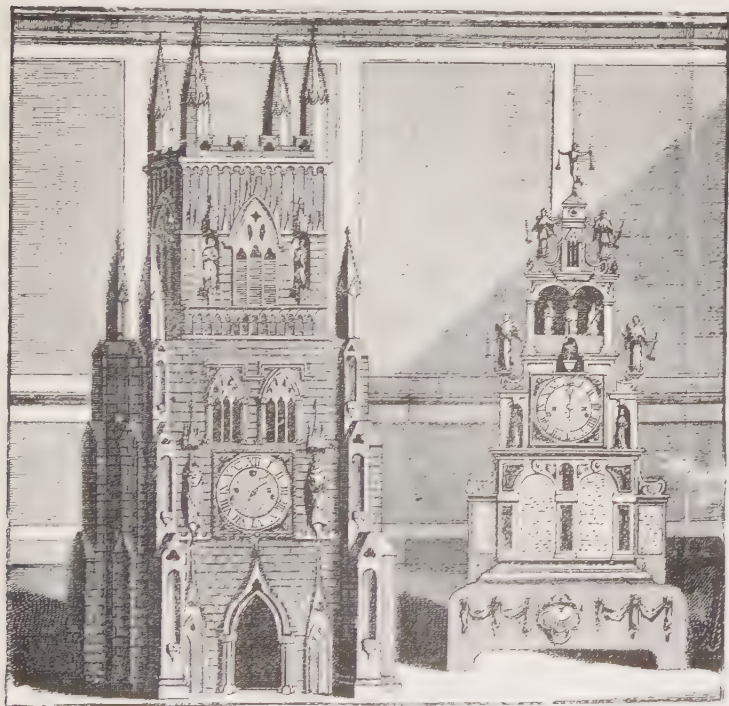


FIG. 212. Lichfield clock.

Gothic architecture, with pinnacles, battlements, windows, mouldings, images, buttresses, etc., admirably painted and well carved. This perspective view of the outward case is so contrived that no part of the inner structure but the dial appears to view, except the front of this case (which consists of an upper and lower door) is thrown open. The clock may be then taken out, appearing then as is shown on the right of the engraving, and placed on the table or elsewhere. The height of the outside case is 5 ft. 2 in.

**Henry
Bridges.**

Henry Bridges, who lived at Waltham Abbey, and was brought up as an architect, seems to have obtained a greater reputation abroad than at home as the producer of clocks with motions representing the heavenly bodies. The specimen of his work delineated in the



FIG. 243.—Bridges' clock.

accompanying figure was publicly exhibited in about 1770 by Edward Davis, who wrote a pamphlet describing it. It is a monu-

mental clock ten feet high and six feet broad at the base. Within the pediment at the top of the structure is a scene representing the Muses on Parnassus; this changes periodically to a forest with Orpheus and wild beasts, which in its turn gives place to a sylvan grove with birds.

On the upper large dial and the four small ones are indicated the seconds, minutes, and hours; the rising and setting of the sun; equation of time, the age phases of the moon, and signs of the zodiac. On the lower of the large dials is exhibited the Copernican system of time, consisting of seventeen bodies, the sun being in the centre and the planets moving round it. On a panel below are a landscape and the sea with representations of moving persons and vessels, and on a second panel men at work in a carpenter's yard. These automata were very popular, and quite suited to the taste of the period. Besides these, the edifice contained an organ, which was played at intervals. Altogether there were, it is stated, over a thousand wheels and pinions in the composition of the mechanism.

It is remarkable how little is to be gathered respecting Henry Bridges among English horological records. Dubois, quoting from the *Bibliothèque Nationale de Paris*, says he was clockmaker in the court of Charles I., and that the identical clock illustrated on p. 260 was made for the Duke of Buckingham. But this account cannot be accepted, for seconds and minute hands were not usual in the time of Charles I.

The wig and dress of Bridges, as given in the same repository, are of the style in vogue at the beginning of the eighteenth century, and we may conclude that this was about the period he flourished.

Jacob Lovelace was born in the city of Exeter, where, in 1766, at the age of sixty, he ended his days in great poverty, having been thirty-four years engaged in constructing the monumental clock shown in the accompanying engraving. The mechanism is enclosed in an elegant cabinet ten feet high, five feet wide, and weighing half a ton, ornamented with Oriental figures and finely executed paintings, bordered by richly carved fretwork. The movements are :
 1. A moving panorama descriptive of day and night. Day is represented by Apollo in his car drawn by four spirited coursers, accompanied by the twelve hours; and Diana in her car drawn by stags, attended by the twelve hours, represents Night
 2. Two gilt

Lovelace's Exeter Clock.

figures in Roman costume, who turn their heads and salute with their swords as the panorama revolves, and also move in the same manner while the bells are ringing. 3. A perpetual almanack, showing the day of the month on a semicircular plate, the index returning to the first day of every month on the close of each month, without alteration even in leap years, regulated only once

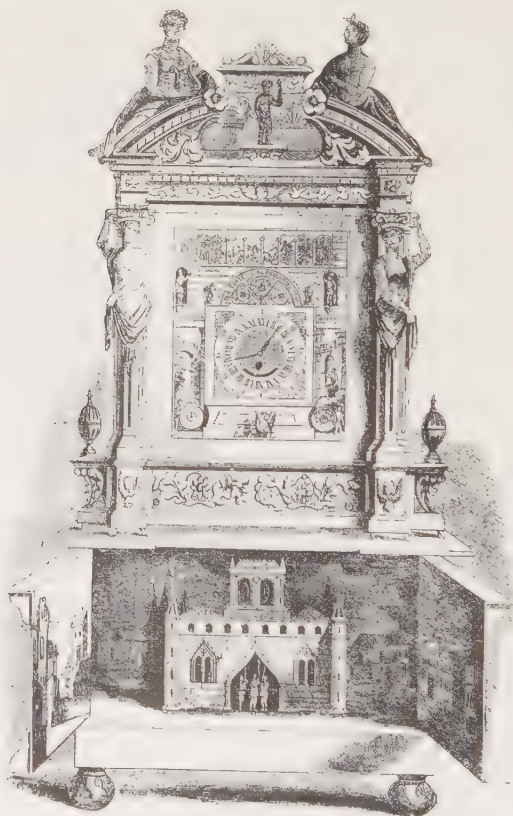


FIG. 244.—Lovelace's clock.

in 130 years. 4. A circle, the index of which shows the day of the week, with its appropriate planet. 5. A perpetual almanack, showing the days of the month and the equation of time. 6. A circle showing the leap year, the index revolving only once in four years. 7. A timepiece that strikes the hours and chimes the quarters, on the face of which the whole of the twenty-four hours (twelve day and twelve night) are shown and regulated; within

this circle the sun is seen in his course, with the time of rising and setting, by an horizon receding or advancing as the days lengthen or shorten, and under is seen the moon, showing her different quarters, phases, age, etc. 8. Two female figures on either side of the dial-plate, representing Fame and Terpsichore, who move in time when the organ plays. 9. A movement regulating the clock as a repeater, to strike or to be silent. 10. Saturn, the god of Time, who beats in movement when the organ plays. 11. A circle on the face shows the names of eight celebrated tunes played by the organ in the interior every four hours. 12. A belfry with six ringers, who ring a merry peal. The interior of this part of the cabinet is ornamented with beautiful paintings, representing some of the principal ancient buildings in the city of Exeter. 13. Connected with the Organ is a bird organ, which plays when required. Beside the dial is the inscription, "*Tempus rerum Imperator.*"

According to an advertisement in the *Flying Post*, July 5th, 1821, this clock was about to be publicly exhibited; and in the same publication for September 8th, 1834, it was announced that "Love-lace's celebrated clock," which for several years was in the collection of Mr. James Burt, had the previous week been sold by auction for 680 guineas by the noted George Robins.

At the International Exhibition, 1851, it was a prominent feature in the Western Gallery. It then belonged to Mr. Brutton, who had it put in order by Mr. Frost, of Exeter, after it had been deranged for some years. In 1888 a suggestion was made in the Exeter Press that the clock should be purchased for the Imperial Institute, but nothing came of it, and the clock was afterwards acquired for the Liverpool Museum, where it remains.

By favour of Mr. George Ellis I am enabled to reproduce an engraving of a self-winding, or as the inventor termed it, "a perpetual motion" clock which now belongs to Mr. W. F. B. Massey-Mainwaring, M.P., and is deposited at the Horological Institute. The energy for keeping the mechanism

**James Cox
and his
Perpetual
Motion Clock.**

in motion was obtained by changes in the pressure of the atmosphere. What at first sight seems to be a huge pendulum is an ornamental glass jar of mercury, suspended from chains. Into this is dipped a tube of mercury, also hung from chains, open at its lower end, and with a large bulb at its upper extremity. With increased atmospheric pressure a little of the mercury in the jar would be forced into the tube. The jar and tube were balanced by weights,

so that the tube being a little heavier by the addition of mercury, would fall a little, and in so doing would raise the weight ; and with a fall in the pressure of the atmosphere, the mercury in the jar

would be increased and its weight would be raised a little. There is no pendulum, but the escapement, which is at the back of the dial, is controlled by a straight bar balance. Wherever possible, the rubbing surfaces were jewelled with diamonds to reduce the friction. The clock is over seven feet in height. James Cox, who constructed this clock, resided for some time in Shoe Lane, and really devoted his life to the production of mechanical curiosities, very much in the style of those devised by Grolhier de Servière. Cox obtained an Act of Parliament in 1773, authorizing him to dispose of his museum by means of a lottery, and for some months his conceptions formed an exhibition at Spring Gardens, where half-a-guinea admission for each person was charged. It was stated in an advertisement that the perpetual

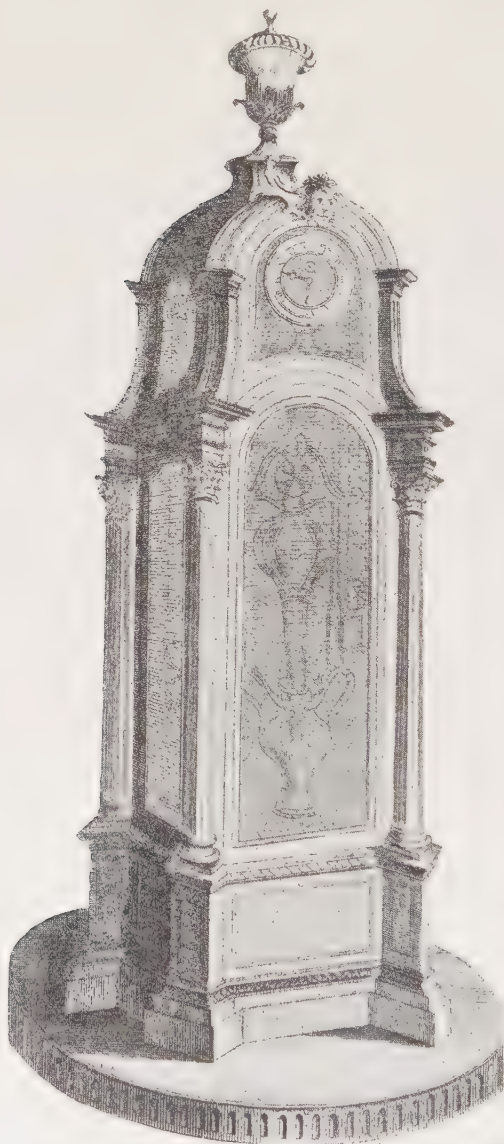


FIG. 245.—Cox's perpetual motion.

motion would occupy the centre of the room. The following certificate was appended to the advertisement :—

“SIR,—I have seen and examined the above described clock, which is kept constantly going by the rising and falling of the quicksilver, in a most extraordinary barometer ; and there is no danger of its ever failing to go, for there is always such a quantity of moving power accumulated as would keep the clock going for a year, even if the barometer should be quite away from it. And, indeed, on examining the whole contrivance and construction, I must with truth say, that it is the most ingenious piece of mechanism I ever saw in my life.

JAMES FERGUSON.

“Bolt Court, Fleet Street,

“Jan. 28th, 1774.”

The awarding of the various pieces to subscribers of the lottery took place in June, 1775. Mason, a rhymester of the time, thus refers to one of his exhibits :—

“Great Cox, at his mechanall,
Bids orient pearls from golden dragons fall ;
Each little dragonet, with brazen grin,
Gapes for the precious prize, and gulps it in.
Yet, when we peep behind the scene,
One master wheel directs the whole machine ;
The selfsame pearls, in nice gradation, all
Around one common centre, rise and fall.”

Another of his “perpetual motion” clocks, which was really to be kept going by the opening and shutting of the door of the room in which it was contained, was for some years on view at the Polytechnic in Regent Street.

Horstmann's Self-winding Clock. In a self-winding clock invented by the late Gustave Horstmann, of Bath, the expansion and contraction of a liquid are used to wind the clock.

A strong metal vessel, A in the figure, is filled with an easily expanding fluid, such as benzoline, mineral naphtha, etc. Connected to this vessel by a strong tube with a very small bore are a cylinder and piston, B and C. Owing to the fact that most expanding fluids are incapable of driving a piston, being too volatile and thin, the cylinder and tube are charged with a thicker and more of a lubricating fluid, such as glycerine. The vessel containing the expanding fluid is on a higher elevation than the piston and cylinder. This is done to prevent them mixing, as benzoline is lighter than glycerine,

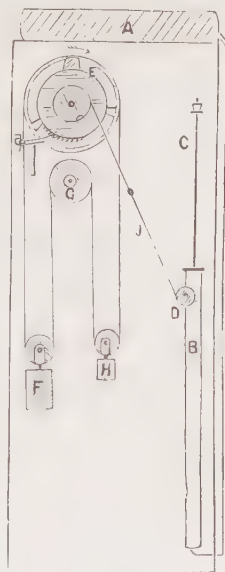


FIG. 246.

and, therefore, rises to the top. It is easy now to see how that when the temperature rises, the expanding liquid will force the piston upward, and, by means of a slight counterforce, the piston will fall on the temperature lowering.

The piston terminates in a cross-bar, to each end of which is attached a steel ribbon like a wide watch mainspring. These two bands are brought down over pulleys at D, fixed on each side of the cylinder, and then carried direct to the winding mechanism, E, of the clock, which is all fixed on the back of the case and independent of the movement. The two bands join into one a little before they reach the winding. A large pulley, E, is fitted on a stud at the back of the case, and is driven by means of a ratchet and click. The pulley E has a flat groove, and is studded with short pins at equal distances apart, over which works a long steel ribbon perforated with oblong holes. This chain passes down through the weight pulley F, which also has a flat groove, but no pins, and is carried over the main wheel pulley G, which is supplied with pins, the same as the winding pulley. It then passes under the pulley of the counterweight H, and is then joined to its other end, thus forming an endless chain. As the piston falls a coiled spring causes the smaller pulley at the top of the case to turn independently of E, and to coil the band J on to itself, ready for the next rise of temperature.

**Fan or
Windmill
Clocks.**

Fans actuated by currents of air have been from time to time used as motors for actuating time-keepers. One, by Lepaute, is at the Paris Louvre. In Dardenne's more recent patent the weight is wound up by the current of air in a chimney acting upon the blades of a fan, which is stopped by a self-acting brake as soon as the weight nears the top of its course.

FRENCH CLOCKS AND CASES IN THE FRENCH STYLE.

**Boulle or
Buhl Work.**

Charles Andre Boulle, who was born at Paris in 1642, became celebrated there as a chaser and inlayer. In 1672, Louis XIV. allotted to him rooms at the Louvre, and his effective inlay work of metal, usually brass and tortoiseshell or turtleshell, speedily became the favoured decoration for furniture of all kinds. He died in 1732. Boulle work for clock cases and pedestals continued popular in

France throughout the eighteenth century, and in a lesser degree here, where the title became corrupted into "Buhl." In some instances the natural tint of the shell would appear. In others the shell would be painted on the back, red or black, according to the effect desired by the designer. Then by way of contrast the arrangement of the materials used was varied in different parts of the same object; for instance, if on the front the outline was of shell, with a design inlaid with metal, the sides or perhaps panels elsewhere would be decorated with the counterpart or "counter," that is, the outline would be metal and the inlay shell. "Counter" or metal outline, though often effective, is considered to be an inferior production.

The particularly handsome Louis XIV. clock and slender pedestal shown in Fig. 247 are in the Council Chamber at Windsor Castle. Together they stand over seven feet in height, and are decorated with red shell and white metal Boulle work, relieved with ormolu mounts sharply chased. The pendulum of the clock is seventeen inches long, descending below the clock case into the pedestal. The upper panel of the latter is hinged to afford access for regulation. This and several other engravings of the clocks at Windsor Castle are reproduced from photographs taken expressly for me by Mr. J. H. Agar-Baugh.

A plainer but very effective pedestal, supporting a calendar clock as represented in Fig. 248, is in the corridor at Windsor Castle. The surface is Boulle work of black shell and brass.

Another choice example, in the Rubens room, appears as in Fig. 249. The front surface is brown shell inlaid with brass, the covering of the sides being in counterpart. The clock case has sphinx corner supports of ormolu and a domed top surmounted by a figure of Time. At the base of the case the three Fates are represented. The hour numerals are on plaques of enamel. Through the glazed part of the front below the dial may be seen the pendulum and the inside of the back of the case, which is covered with inlay in counterpart. The style of this clock, apart from the pedestal, was long in favour with French manufacturers.

Many of the best designs of the Louis XIV. period were by Daniel Marot, who was born at Paris in 1660. By the revocation of the Edict of Nantes he was driven to England, but in 1702 took up his abode in the Netherlands. Appended are some examples from a collection of his works published at Amsterdam in 1712. In this book he was described as "Architecte de Guillaume III., Roy de la



FIG. 247.



FIG. 248.



FIG. 240.



FIG. 253.—Clock by Julien Le Roy.

Grande Bretagne." Fig. 250 by him does not show the minutes ; it has an hour hand and a hand for pointing to the day of the month on a circle outside of the hours. Fig. 251, also by Marot, has a minute indicator, and may be of a slightly later period. Fig. 252, though very much in the style of the Windsor Castle brass inlay clocks, is of more recent date.

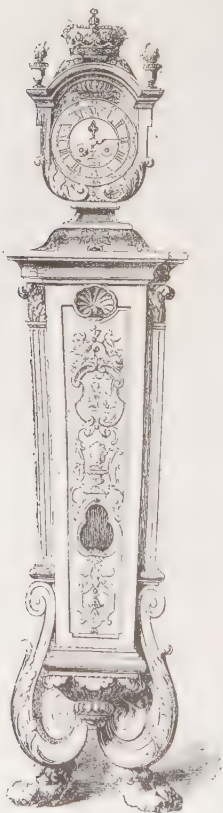


FIG. 250.



FIG. 251.



FIG. 252.

Figs. 254, 255 and 256 are bracket or table clocks, by Marot. The superbly designed specimen shown in Fig. 254 is really perfect.

In the corridor at Windsor Castle is the fine long-case clock by Julien Le Roy illustrated on page 269. The dial has a brass centre with silvered border, and shows solar and mean time and the day of the month. The escapement is a modification of the Graham,

each pallet being pivoted separately. On the dial is inscribed, "Inventé en 1736 par Julien Le Roy, de la Société des Arts."

The case is of kingwood inlaid with some lighter veneer to an angulated design and carries heavy ormolu well-chased mountings.

A companion case in the corridor contained a clock by Ferdinand



Fig. 251

Berthoud, but the movement has been reconstructed by Vulliamy and the dial altered.

On page 274 is shown a superb twelve-month timepiece by Lepaute, which adorns the Zuccarelli room at Windsor Castle. The movement is exceedingly well made, and has a very light pin-wheel escapement furnished with pins on one side only. The

pendulum beats seconds, and is compensated on Harrison's "grid-iron" plan. The dial, of enamel, is very fine, and the lower edge of it bears in tiny characters the signature "G. Merler." Besides the



FIG. 255.

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hour and minute indicators, which still exist, there was originally a centre seconds hand and one for showing the equation of time. The month and day of the month appear through a slit in the lower

part of the dial. There are no winding holes, the weight being raised on Huygens' plan, by pulling down the rope. The case is of ebony, relieved with exceptionally fine ormolu mountings.

A fine chiming clock by Vulliamy, with case in the Louis XVI.



FIG. 256.

Dictionnaire de l'Ameublement.

style, and dating from about 1820, which is also in the Zuccarelli room at Windsor Castle, may be mentioned here. The outline of the case is excellent, as may be seen from Fig. 258; the surface of black shell inlaid with brass is decorated with bold but rather coarsely chased ormolu mounts.

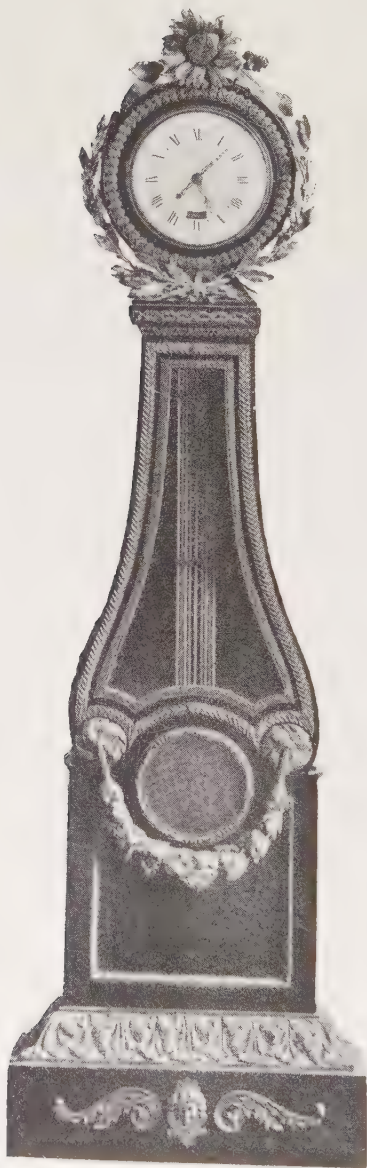


FIG. 257.
Timepiece by Lepaute.



FIG. 258.
Chiming clock by Vulliamy.

Fig. 259 shows a splendid Boulle clock which is in the Octagon room at Windsor Castle. A Cupid surmounts the structure, and



FIG. 259.

below the dial is a reclining figure of Time holding a balance. It is three feet in height and of Louis XIV. period, except the plinth, which is of later date.

Mantel Clocks before the time of Louis XV. are exceptional. When not supported by a long case or a pedestal or a bracket chamber clocks were hung to a nail on the wall.

Hanging or "Cartel" Clocks of Louis XV. period were usually of metal thickly gilt and graceful in form, and when oxidation had toned down the somewhat obtrusive garishness of the gilding, of very pleasing appearance. The fine speci-

men here represented (Fig. 260) belongs to the Hon. Gerald Ponsonby, by whose permission it was drawn.

A fine example of design in the Louis XV. style is the *ormolu* clock by "Gudin à Paris" at Windsor Castle, and shown in Fig. 261. The chasing is bold, though somewhat coarse. The pierced diaper work below the dial is backed with crimson silk with good effect. The hands are excellent; the short broad hour indicator forms a proper and unmistakable contrast to the long pointer for the minutes.

Another excellent and characteristic specimen of the Louis XV. style is the drawing-room clock represented in Fig. 262, which is almost a counterpart of one at Versailles. It is by Etienne Le Noir, and is distinguished by remarkably sharp chasing. Indeed, a more harmonious arrangement of chased decoration or work of the kind better executed, it would be difficult to find. The dial and hands are particularly good, but like many other productions of this period, the dial is somewhat marred by the awkwardly placed and unsymmetrical winding holes.

No better example of the Louis XVI. period could be selected than the chaste and elegant boudoir or ante-room clock shown in Fig. 263. It is of white polished marble, which age has tinted to a dark cream, with gilt mountings, the contrast har-

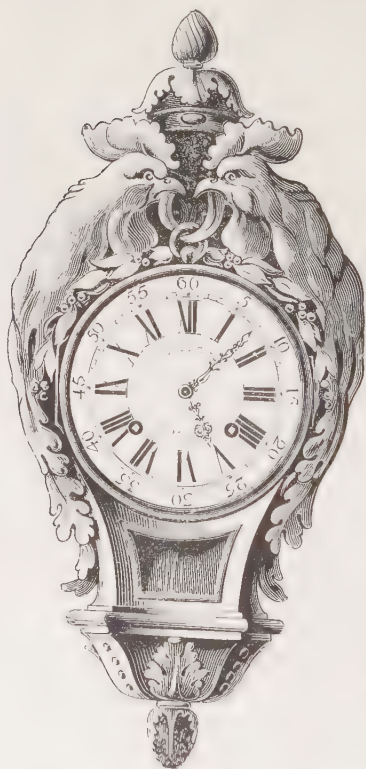


FIG. 260.—Cartel timepiece.

monizing perfectly. It dates from about 1780 and is by Robin, "horloger du Roy."

The splendid mantel clock shown in Fig. 264 in the Louis XVI. style, is perhaps of a little later date, some points being suggestive of the transition period between the Kingdom and the First Empire. The beautifully modelled Cupids representing sculpture (adjacent to a completed bust of Henri IV. of Navarre), music, dancing (or

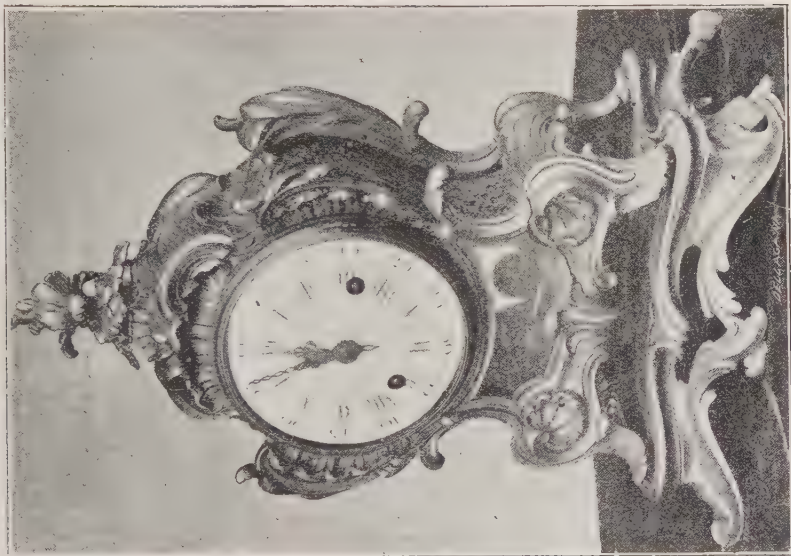


FIG. 262 (A S).



FIG. 261.



FIG. 264 (A S).

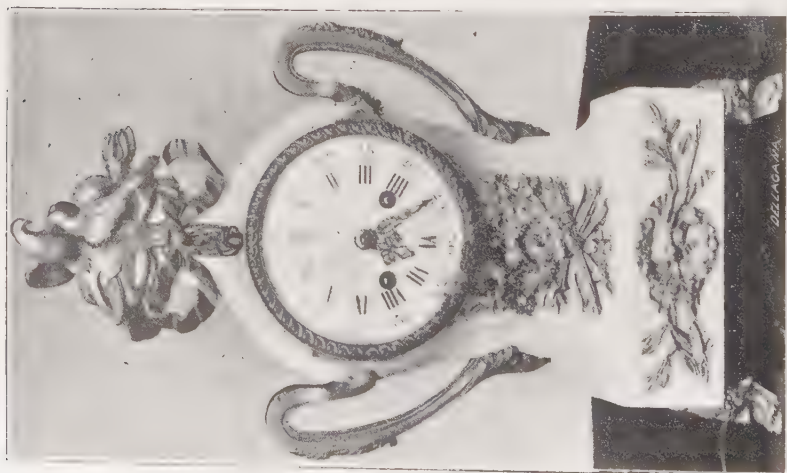


FIG. 263 (A S).

singing), and painting appear to be nestling in clouds around a celestial sphere in which the dial is placed. The plinth of white marble with rounded ends contains a gilt frieze of trophies. It is $17\frac{1}{2}$ inches in length and 18 inches high. The movement is inscribed "L. J. Leguesse." The gilding and chasing are excellent, the minutest details of the bronze work being brought out in the style of a master artist. Here, as in the last example, the association of white marble and bronze produces a most pleasing effect. These two clocks are the property of a London collector.

Fig. 265 shows a celebrated clock at the Palais de Versailles, dating from about 1750. The case is of bronze gilt, and within the glass globe surmounting the structure are representations of the earth, moon and planets, travelling in their respective orbits. It was invented by Passement and constructed under his direction by Dauthiau, clock-maker to Louis XV.

Lyre-shaped exteriors were, it must be confessed, among the most elegant conceptions of the Louis XVI. period. From the example illustrated in Fig. 266, which is at Windsor Castle, it will be seen that the upper part of the pendulum is formed to represent the strings of the instrument ;

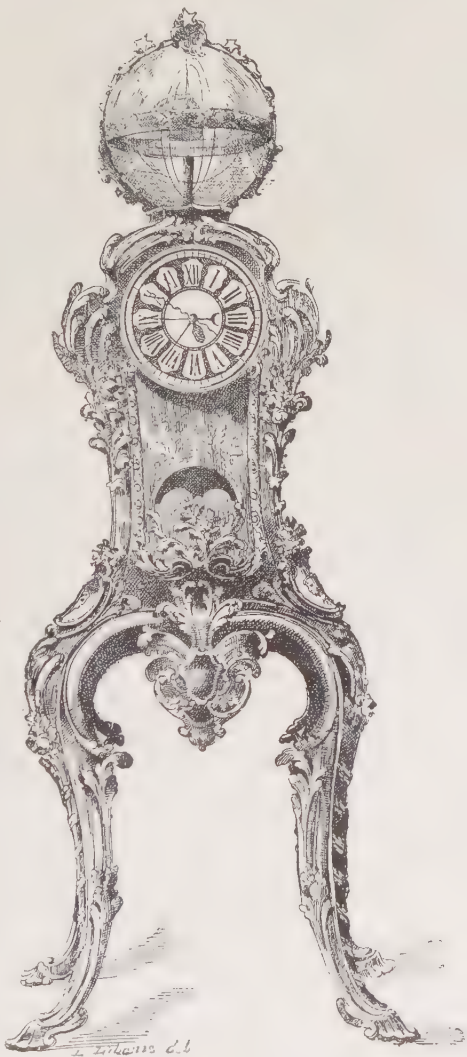


FIG. 265.—Astronomical clock by Passement at Versailles.
Dictionnaire de l'Aménagement.



FIG. 267.

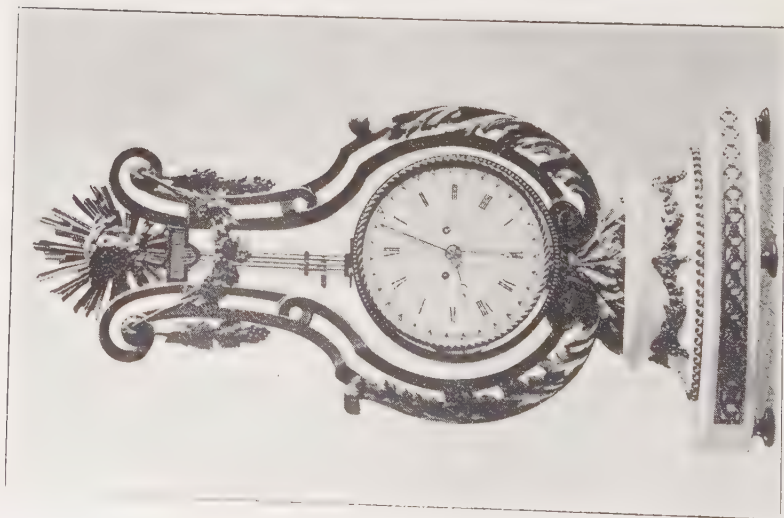


FIG. 266.

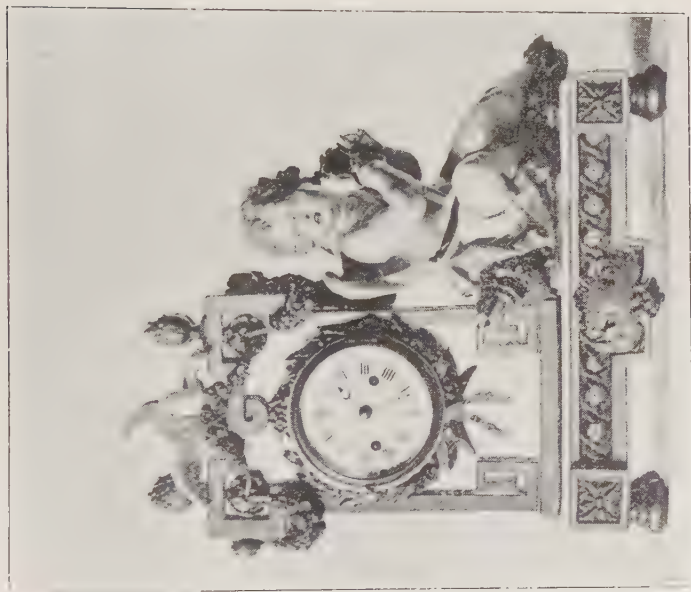


FIG. 269.

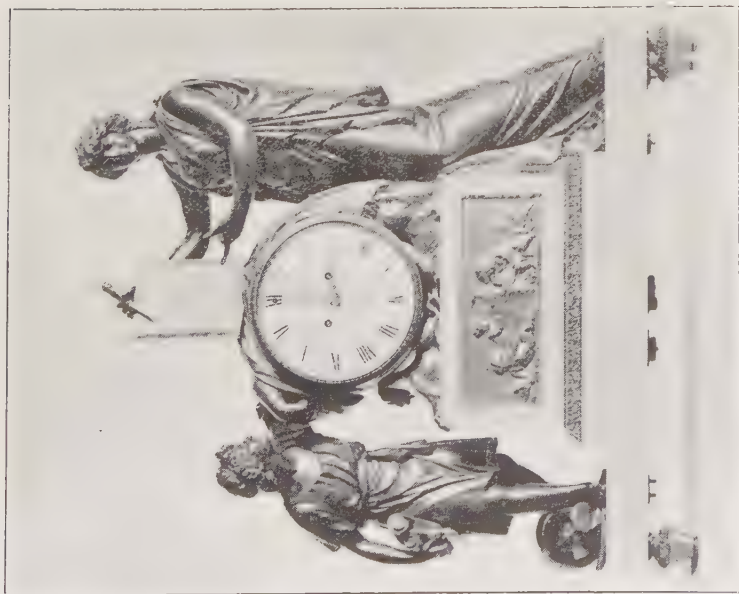


FIG. 268.

the lower end, shaped as a ring, passes and repasses behind the dial with very pleasing effect. The dial is quite modern and bears the inscription, "Hanson, Windsor."

A lyre clock in the Jones collection at the South Kensington Museum is inscribed, "Kinable."

The blue Sèvres vase clock shown in Fig. 267, in the Louis XVI.



FIG. 270.

style, affords another example of the fancies characterizing the latter part of the eighteenth century.

The very pretty example of Louis XVI. style which is shown in Fig. 268, is by Vulliamy, and graces one of the drawing-rooms at Windsor Castle. On the ormolu slab above the dial is a drawing of the fusee and demonstration of its action.

Fig. 269 is another specimen by the same maker, and is also at Windsor Castle.



FIG. 271.
Dictionnaire de l'Aménagement.



FIG. 272.

For the example shown in Fig. 270, dating from about 1790, I am indebted to Mr. Robert Rolfe.

From about 1760 till well on in the nineteenth century, elegant mantel clocks of marble and bronze, in which the dial depended from a handsome entablature, were much favoured in France. The



FIG. 273.—Clock in Windsor Castle.

specimen shown in Fig. 271, with supporters on each side of the columns, gives a good idea of the best of them. Berthoud was apparently partial to this form, judging from the number to be seen with his name thereon.

The clock with white marble base and sphinx supporters for the dial, and shown in Fig. 272, by Soliaus, Paris, is at Windsor Castle.

With the return of Napoleon from Italy came a marked change in the French style of design. The soft harmonious conceits of Louis XVI. artists gave place to more severe and statuesque productions with heavy draperies, founded on ancient Roman models. Characteristic specimens are illustrated in Figs. 274 and 275.

Fig. 275 shows a fine clock in the First Empire style, which is at Windsor Castle. It is by Jefferson, London, and dates from about 1840.

Portable table or bedroom clocks, cased in the form of a drum, and especially convenient to travellers, were in favour from the latter part of the eighteenth century till debased and shorn of all enrichment they degenerated both as ornaments and timekeepers. An example in the best style, with well chased gilt Fauna as supporters, and surmounted by an eagle holding a ring by which the clock could be lifted, is shown in Fig. 276. It strikes the hours

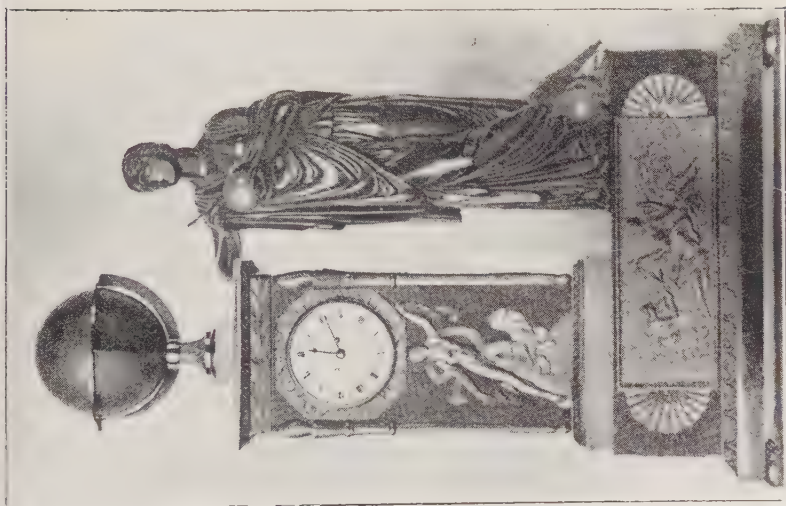


FIG. 275.

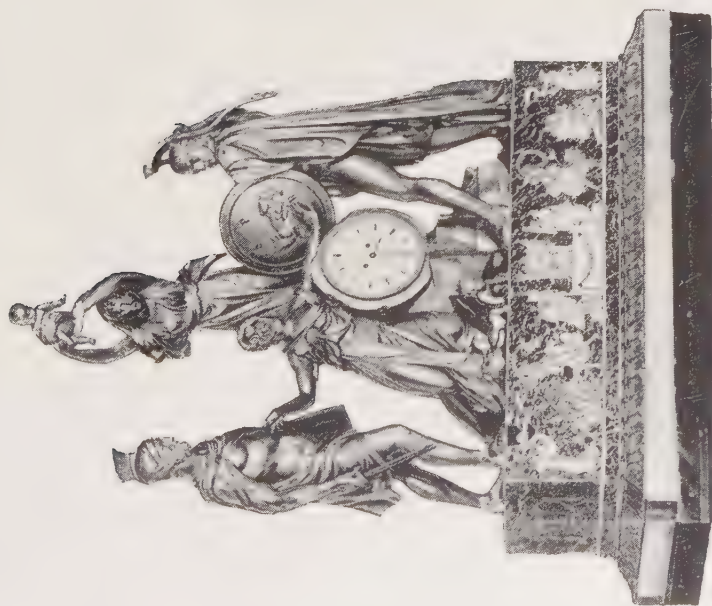


FIG. 274.

Clock by Vulliamy at Windsor Castle.

and quarters, and the striking may be repeated at pleasure by pulling out the knob on the back of the eagle; it is also provided with an alarm.



FIG. 276 (A S).

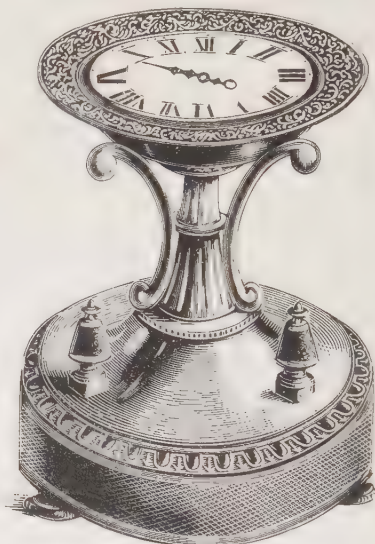


FIG. 277 (A S).

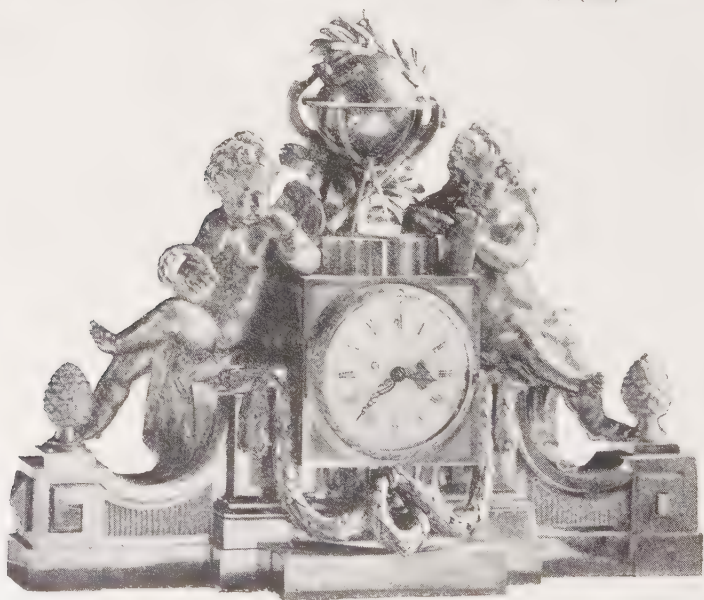


FIG. 278.

Table clocks with horizontal dials were revived during the First Empire. A pretty specimen of gilt metal, in which the movement is enclosed by the base, is shown in Fig. 277. It strikes the hours and quarters.

Clocks with cases of a nondescript character, but abounding in formolu or gilt metal ornament so popular at the latter part of the eighteenth and beginning of the nineteenth centuries, seem to have entirely died out of favour. At Windsor Castle is a fine example with a winged boy on each side of the dial, and a celestial globe and mathematical instruments above it, as shown in Fig. 278.

“MYSTERY” CLOCKS AND VARIOUS OTHER CURIOUS TIMEKEEPERS.

Falling Ball Timekeepers.

In the British Museum are two specimens of this remarkably clever and elegant piece of seventeenth century mysterious horology. One

of them is inscribed, “Jacob Behan, Vienna.” It is a sphere of brass four inches in diameter, to be suspended from a bracket, or the ceiling of a room. The upper and lower portions of the ball are gilt, while around a silvered band in the middle are marked two serials of Roman numerals from I. to XII., and subdivisions for the quarter hours. The extremity of one of the wings of a Cupid on the lower part of the ball points to the hour of the day or night. The

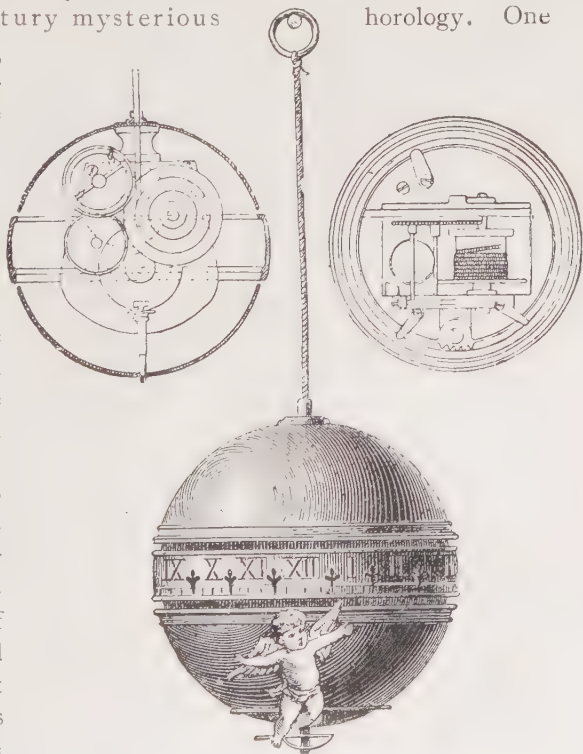


FIG. 279.

construction may be gathered from the vertical and horizontal sections which are given in Fig. 279, borrowed from "*Les Merveilles de l'Horlogerie.*" The suspending cord is coiled round a barrel, with which is connected a train of wheels terminating in an escapement and balance. While the top and bottom of the ball are rigidly connected, the middle is free to move, and is furnished with

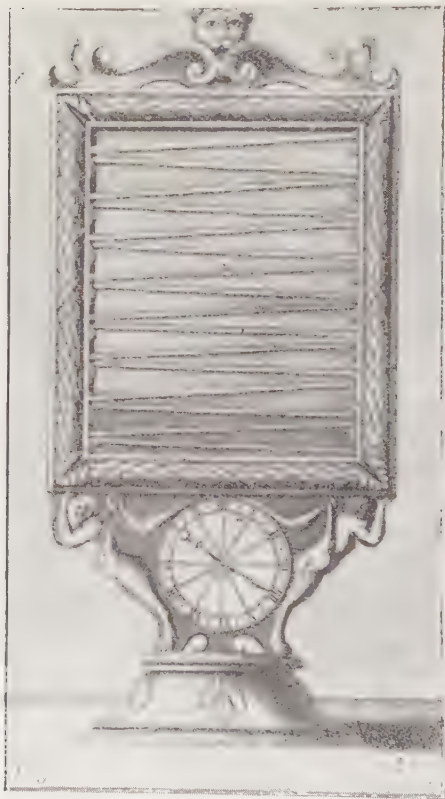


FIG. 280.

a ring of teeth projecting inside, through which the middle is rotated once in twenty-four hours, the weight of the ball acting as a driving force. The mechanism is wound by simply raising the ball with the hand, there being a weak spring in the barrel, which causes it to turn and coil the suspending cord on to itself.

Figs. 280 and 281 represent two of many timekeepers designed and made by a truly remarkable mechanical genius, Nicolas Grollier, afterward M. Grollier de Servière, who was born at Lyons in 1593, and passed his early manhood in the service of the French army. His later years he devoted to designing all sorts of mechanism, and, thus providing himself with ample occupation, he

managed to reach the good old age of ninety-three years.

These two drawings are from a thick quarto book written by his grandson, and dedicated to Louis XIV. In the first example a small ball runs down inclined shoots, and by its momentum unlocks the train as it reaches the bottom. There are two balls, and as the first disappears from view the second one begins its descent. The balls are, in turn, carried up at the back by a kind of tape ladder

with pockets, which passes over a pulley at top, and another at the lower part of the case.

Globes, Urns, and Vases. In the "Atlas" timekeeper by Grollier de Servière (Fig. 281), the movement within the globe causes the central band, on which the hours are marked, to

revolve, the arrow of course indicating the time. The upper and lower portions of the globe are stationary.

A taste for revolving band timekeepers, formed as globes, urns, and vases, revived in France during the eighteenth century. The exteriors of some of these were of very elegant design, as may be judged from the examples submitted.

Fig. 282 shows a particularly attractive one dating from about 1780, which is at the South Kensington Museum. The boys supporting the globe are of bronze. The moving band contains two sets of numerals painted blue on enamelled plaques; the lower set represent the hours counted twice from I. to XII., and the upper set each fifteen minutes. The tongue of the snake forms a bar across each successive hour



FIG. 281.

numeral, as an indicator, and reaching beyond it, points to the minutes also.

In the Throne-room at Windsor Castle is a globe clock which has double revolving bands, Roman hour numerals being marked on one band, and on the other Arabic figures to represent the minutes. It is by Maniere, of Paris, and adorned with a well executed group, as in Fig. 283. The ball, enamelled in royal blue, forms a properly

conspicuous centre, on each side of which the statues are arranged. The hour is shown by the coincidence of a numeral with the brass vertical bar supporting the globe, while the Destroyer is posed to indicate the minutes with his scythe.

Fig. 284 represents a vase clock, which is said to have belonged to Marie Antoinette. The movement was covered by a handsome carved marble pedestal, the urn being of porcelain with bronze



FIG. 282.

mountings. A serpent coiled round the foot of the vase had its head erect to point to the hour on the double polygonal band.

In Fig. 285 is reproduced a magnificent design by Falconet, wherein the three Graces are portrayed, one of whom indicates the hour with her finger. The vase is supported by a column standing on a handsome plinth; the panels of the plinth show very choice carvings of groups of children at play.



FIG. 283.

FIG. 285.

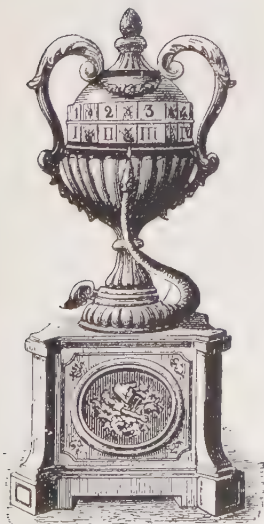
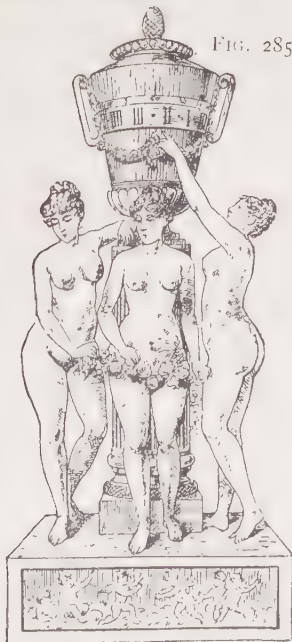


FIG. 284.



Among the eccentricities of French horology is one at Buckingham Palace in the form of the head of a negress, as shown in Fig. 286. Figures corresponding to the hours appear in proper order in one of the eyes of the negress, the minutes being denoted in the other eye



FIG. 286.—Negress-head clock at Buckingham Palace.

in a similar way. By closing the eyelids the figures may be rendered invisible.

**Rolling
Clock.**

This ingenious device appears to have been patented by that universal genius the Marquess of Worcester, in 1661 (No. 1311). It was also made by Grollier de Servière probably about the same date. Maurice Wheeler published

a description of it as his invention in Lowthorp's "Abridgment of the Philosophical Transactions in 1684." The construction of it will be understood from the uncovered view of the front, Fig. 287. There is a train of wheels and an escapement as in a watch. The great

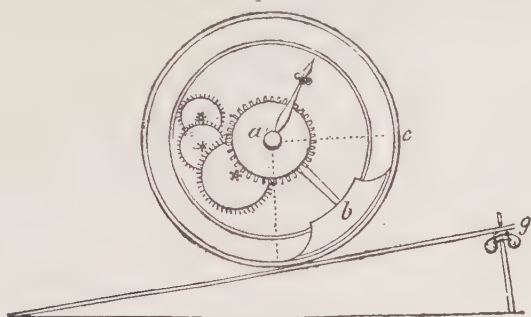


FIG. 287.

wheel *a* carries the hand and also the weight *b*. The clock never requires winding. It is every morning simply placed at the top of the inclined plane, down which it gradually rolls during the day, the

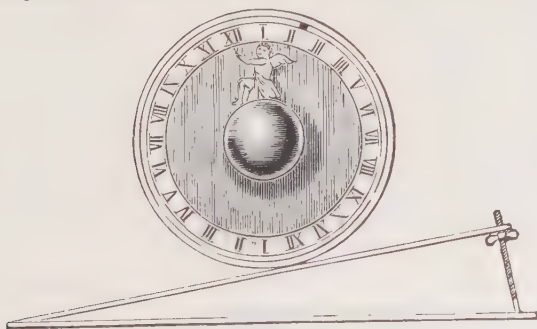


FIG. 288.

hand pointing to the hour marked on a dial, which of course covers the mechanism. The length of the plane had better be more than twice the circumference of the clock case *c*. Its inclination may be regulated by the screw *g*. The hand may be in the form of a figure of Time, as in Fig. 288, a serpent's head, or other grotesque design.

The weighted lever of the rolling clock, as shown in Fig. 287, has been utilized in another form of mysterious timekeeper, an exterior view of which is given on page 294. It was patented in 1808 (No. 3185) by John Schmidt, a watchmaker, living in St. Mary Axe. He called it "The Mysterious Circulator, or Chrono-

**Schmidt's
Mysterious
Clock.**

logical Equilibrium." The ring A is divided into hour and five-minute spaces. The watch movement, with the weighted lever, is contained in the box, C, but it is now driven by a mainspring in the usual way. The hand is pivoted to the tail of the dolphin. D is a counter-weight. The weighted lever revolves once in 12 hours; it would be nearest to the centre of motion of the hand at 12 o'clock, and furthest from it at 6 o'clock; it is easy, therefore, to see that by this displacement of the centre of gravity the weighted lever would

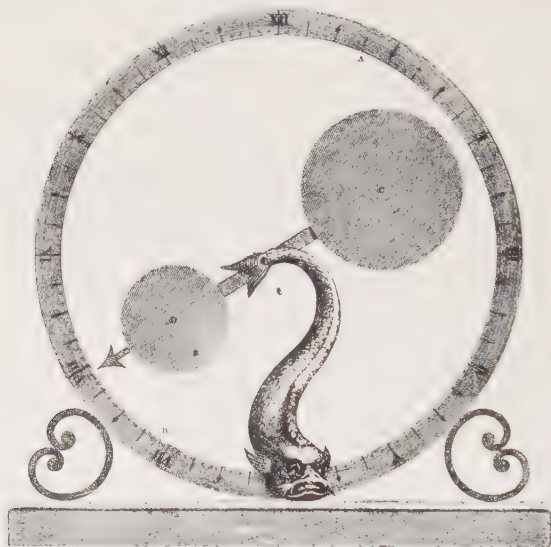


FIG. 289.

cause the hand to revolve and point to the time. It appears that Schmidt was a Dane, who was taken prisoner at Copenhagen, and brought to England. The clocks were sold by Rundle and Bridge, whose shop was in Ludgate Hill. Several distinguished persons are stated to have become purchasers. Some years ago I saw one belonging to Mr. Robert Napier, which bore the name of McNab, Perth.

This device has been several times re-invented, but never, I think, in so elegant a form as the original.

Fan-shaped Clock.

Among other forms of mysterious clocks was one in the shape of a fan, which is said to have been constructed by Pontius de Tyard. The illustration, Fig. 290, was published some time ago in *La Nature*. The fan, composed of thirteen very light slats, is pivoted to a

backing covered with velvet, and at six o'clock in the morning and in the evening would be wide open as shown, and a serpent, fixed



FIG. 290.



FIG. 291.



FIG. 292.

by its tail to the velvet, would point to the hour with its tongue. Immediately after six o'clock the fan suddenly closes, the serpent still pointing to six, but it would then be the figure on the right-hand side of the fan. On a continuation of the joint of the fan is a pinion actuated by a rack in connection with a snail-shaped cam, which causes the fan to gradually open as the hours progress, and then suddenly close.

Two time-

Hand pieces mount-
Mirrors. ed in hand

mirrors are shown in Figs. 291 and 292. They are from an engraving the pro-

perty of M. Bacqucoille, *pace Revue Chronométrique*, and date probably from about 1780. It will be noticed that the dials are divided into six hours. This may be to obtain more exact fractions, or in conformity with the counting of the hours in parts of Italy; most likely the latter, for the designs altogether are rather in the Italian style.

Magnetic Timekeepers.

Grollier de Servière devised a timekeeper resembling a shallow bowl with a wide rim, having marked thereon the twelve hour numerals, as in Fig. 293; the bowl being filled with water, the figure of a tortoise was placed on it and at once floated round till it pointed to the time, and then gradually crept to the figures in

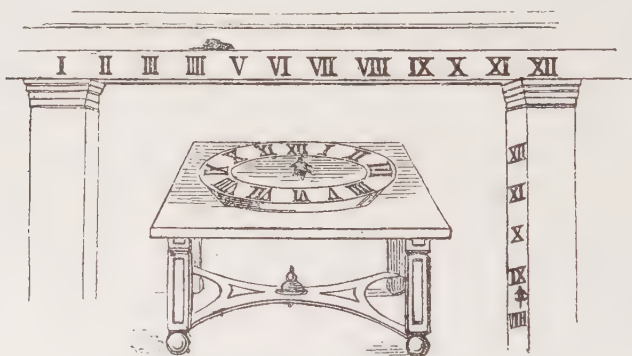


FIG. 293.

succession as the hours advanced. Underneath the rim of the bowl was a magnet of the horseshoe type, which was caused to revolve once in twelve hours; the tortoise was of cork and carried the "keeper" of the magnet. By the same agency he was enabled to cause a lizard to ascend a column and a mouse to creep along a cornice with the hours marked on the fascia below.

Congreve Clock.

In 1808 Sir William Congreve, of Garden Court, Temple, who had invented other curious clocks, patented a timekeeper in which a small steel ball rolled down grooves in an inclined plane, which was movable on its centre. The grooves were zigzag, forming a succession of V's, so that the ball, once started, traversed the whole surface of the plate by rolling down one groove and entering the next at the point of the V. On arriving at the lowest point of the inclined plane the ball had sufficient impetus to unlock the train, which thereupon

reversed the inclination of the plane or table by the intervention of a crank and connecting rod, and the ball started on its journey in

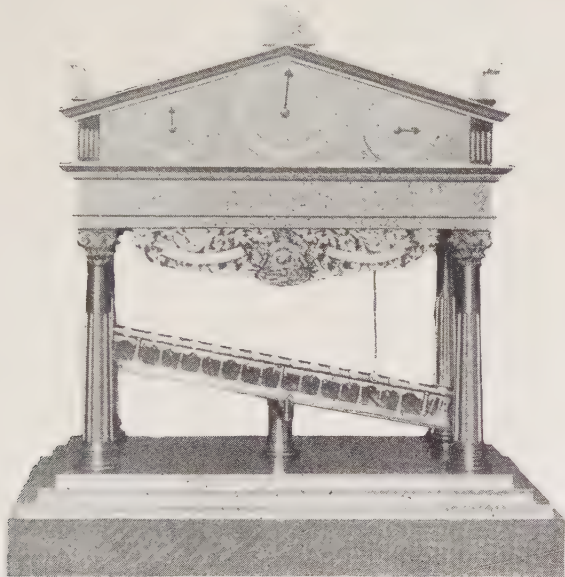


FIG. 294.—Congreve's Clock.

the other direction. Congreve clocks, as they are called, go fairly well if made with exactness and kept free from dust. For the illustration, Fig. 294, I am indebted to Mr. Daniel Buckney.

Japanese Clocks

are peculiar. Until quite recent years the Japs divided the daylight and darkness each into a period of six hours, which therefore, except twice a year, would be of unequal duration. Fig. 295 shows a simple and very general form of Japanese timepiece, taken from a specimen at the Horological Institute. There is no dial, but the progress of time is indicated by the downward motion of the driving weight. A pointer attached to the weight projects through a longitudinal slit running the length of the body of the case, and clasped on to the front are metal hour marks which may be adjusted to different heights by the thumb and finger. The custom was to set these hour marks once a fortnight far enough apart to correspond with the length of the hour for the particular period of the year according to a scale engraved on the case.

In a form of striking clock presumably used by the more wealthy

classes, dials were provided and also two balances of the cross-bar kind, one of which controlled the motion by day and the other by night. At sunset, by means of a pin in the locking-plate of the striking train, one was automatically switched out of connection with the train, and the other substituted. Each arm of the balances had notches throughout its length, and the weights were shifted by hand at fortnightly periods as in the more primitive time-keepers. Half-hours as well as hours were sounded, the strokes on



FIG. 295.

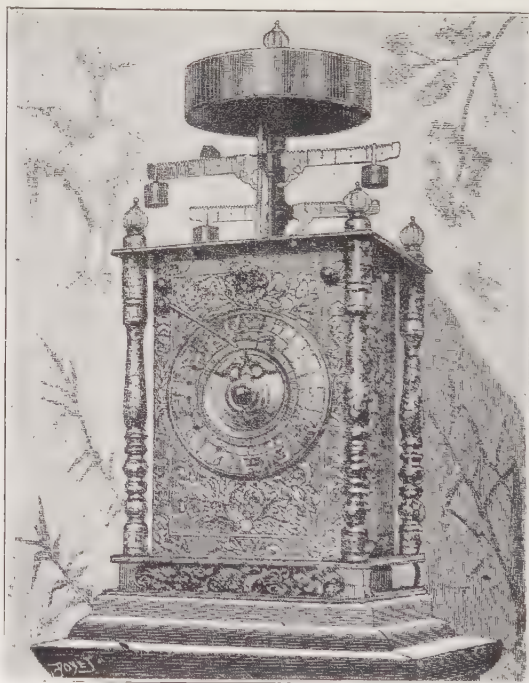


FIG. 296.

the bell being given in the following order: 9, 1, 8, 2, 7, 1, 6, 2, 5, 1, 4, 2. The hours are 9, 8, 7, 6, 5, 4, the halves, 1, 2, 1, 2, 1, 2. In this way, when the half-hour was struck the hearer knew to which one of any two hours it referred.

There is a cross-bar Japanese clock with dial at the Horological Institute, and one with the automatic alternating arrangement at the South Kensington Museum. Fig. 296 shows it very well. This and Fig. 297 are from *La Nature*, which two or three years ago contained an interesting article by Mons. Planchon on Japanese

methods of timekeeping. No. 1 of Fig. 297 is of porcelain, and No. 2



FIG. 297.

decorated with Japanese lacquer. In the latter the driving weights are masked with tassels.

THE PROGRESSION OF ENGLISH DOMESTIC CLOCKS.

The manufacture of chamber clocks for domestic use, as distinguished from the costly and highly decorated timekeepers made for public buildings, or to gratify the tastes of the wealthy, seems to have commenced about 1600. These chamber clocks were of the pattern known as "lantern," "birdcage," or "bedpost." They were supported on a bracket, and wound by pulling down the opposite ends of the ropes to those from which the driving weights were hung. In some instances all the hours were struck in regular progression on the bell surmounting the structure, and sometimes the bell was only utilized as an alarm. In all cases the second train, for

actuating the hammer, was placed behind the train for the watch, or going part. The framing was composed of four corner posts connecting top and bottom plates, the pivots of the trains being supported in vertical bars. In none of them was the train calculated for going more than 30 hours. At first the escapement with vertical verge and a balance as in De Vick's clocks was used as the controlling medium, the verge being usually suspended from a string.

About 1661 the pendulum was introduced, and quickly superseded the balance. The escape wheel was then as a rule planted to work in a horizontal plane, the pendulum being attached to the verge, and swinging either between the two trains of wheels or behind, according to the fancy of the maker. The alternate appearance of the pendulum weight at each side of the case led to its being called a "bob" pendulum, and pendulums of this kind are still known as bob pendulums, in contradistinction to the longer variety which at a later period, and with the anchor escapement, vibrated in a much smaller arc.

The movement was enclosed at the back with a brass plate; at the front with the dial, also of brass, with silvered hour circle and engraved numerals; at the sides with brass doors, and when the pendulum was between the trains, a slit was cut in each door for the pendulum to "bob" in and out of.

In the earliest of these clocks the dials were, as a rule, thickly gilt; the hour circles narrow and the numerals stumpy, the front one of the frets surrounding the bell at top usually having a shield for the crest or initials of the owner. The doors were often made of sun-dial plates, as may be seen from the engraving on the insides of early specimens; doubtless the introduction of clocks played havoc with the demand for the older time recorder, and induced many sun-dial makers to turn their attention to the production of clocks. The maker's name was engraved along the base of the fret; or inscribed at the top or bottom of the centre of the dial, just within the hour ring; or placed out of sight under the alarum plate, the latter practice leading to the assumption that the clock was to be sold by some one other than the maker. It may be assumed that each of the leading craftsmen introduced alterations in style from time to time and designed fretwork and other ornament for his exclusive use; but it is pretty evident that such variations were speedily copied by the general run of makers, for most clocks of the same period bear a marked resemblance to each other; possibly much of the material was supplied from the same foundry and cast from the same patterns. About



FIG. 298.—“Great Chamber Clock,” 1623.

1650 the hour circles were made wider, with longer numerals, and the fret with the crossed dolphins came into use.

Among those who subscribed to the fund for obtaining the

Charter of Incorporation of the Clockmakers' Company in 1630 was William Bowyer, who then appears to have been a clockmaker of repute. It is stated in Overall's "History of the Clockmakers' Company," that in 1642 Bowyer presented to the Company a great Chamber clock in consideration of his being thereafter exempted from all office and service as well as quarterage and other fees.

Fig. 298 shows what must be regarded as a particularly interesting specimen of Bowyer's work. It is a "large Chamber clock," which measures $8\frac{1}{2}$ inches across the dial, its total height being $16\frac{1}{2}$ inches. Around the centre of the dial is inscribed, "William Bowyer of London, fecit 1623." This was doubtless formerly covered by an alarum disc. Along the bottom of the dial is engraved, "Samuel Lynaker of London." Now Samuel Linaker was named in the Charter

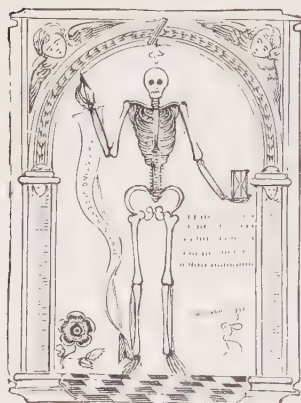


FIG. 299.

of Incorporation of the Clockmakers' Company to be one of the assistants, as the members of the Committee of Management were termed, and it seems to be a fair inference that the clock was made by Bowyer for Linaker.

On the side door of the clock, which is visible in Fig. 298, a figure of Time is engraved; and on the other door a figure of Death, as shown to a reduced scale in the sketch, Fig. 299. In the right hand of the figure appears to be a torch, and depending therefrom is a streamer, on which are the words, "The sting of death is sinne." The left

hand holds a sand glass, and underneath are the following lines:—

"Man is a glase, Life
Is as water weakly washed about,
Sinns brought in death.
Death breaks the glase,
So runes this water out."

In larger characters is the admonition, "Memento Mory."

When I saw this clock it was in the possession of Mr. Percy Webster, whose courtesy in allowing me to obtain the drawings here reproduced I desire to acknowledge. I remember seeing another large lantern clock by the same maker which was inscribed, "William Boyear, in Ledenhall Streete, fecit." The movement of this clock was arranged in the usual manner, the striking train behind the going, and working in three upright bars. It required a great fall of

the driving weights to go thirty hours, as each of the main wheels made one rotation per hour. The original vertical escapement, as usual, had been removed ; but from parts remaining it could be seen that it was identically the same as the drawings of De Vick's. The

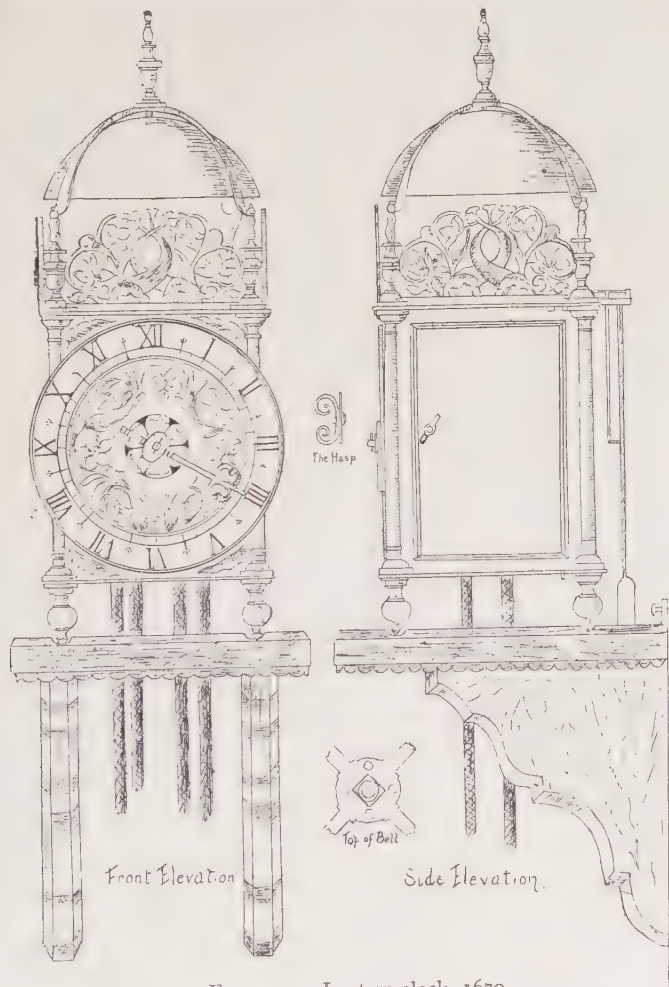


FIG. 300.—Lantern clock, 1670.

wheels and pinions, as one sometimes finds, were very little cut, and though evidently rounded by hand, seemed beautifully correct, and ran easily without chattering. The hour wheel was driven by a pinion of four, the end of the main wheel staff being filed up into four pins to serve the purpose.

Clocks of this size were I think exceptional. Most that I have seen of the period varied from about 3 inches by $2\frac{1}{2}$ inches to 5 inches square. Larger movements were more favoured at the end of the seventeenth and beginning of the eighteenth century. The engraving (Fig. 300), taken from a small specimen, is from a drawing by Mr. William Newton, and shows well the usual arrangement on a bracket. On p. 175 is a lantern clock by Tompion dating from about 1665.

A noticeable alteration in lantern clocks, which was certainly no improvement to their appearance, was to increase the size of the dial, so that it projected as much as from two to three inches each side of the frame. Clocks of this form are commonly termed "sheep's-head." A great number of them appear to have been



FIG. 301.—Heraldic.

made in the latter part of the reign of William III., and in the time of Queen Anne.

With such little variations in the style, these brass clocks seem to have been made from the time of Elizabeth until about the beginning of the reign of George III., the later specimens being principally of provincial manufacture, and with square arched-top dials. They are still often to be met with in the country, enclosed in a wooden hood as a protection from dust, with pendulum and weights hanging below. Sometimes they are without any extra case, and, instead of being placed on a bracket, are simply attached to the wall by means of an iron loop and two prongs.

The "fret" at the top of the case may in many instances be somewhat of a guide in estimating the period of a lantern clock.

Appended are some examples, for most of which, and for much other information, I am indebted to Mr. Percy Webster, of Loudoun



FIG. 302.—The fret of William Bowyer.

Road, St. John's Wood, who is an authority on ancient clocks and watches.

The heraldic fret (Fig. 301) was in use at the earliest period up to



FIG. 303.—The fret of William Bowyer and Thomas Loomes.

1630 or 1640. William Bowyer, Thomas Loomes and Peter Closon (Figs. 302, 303, 304) are diverse styles between 1620 and 1640, while the Thomas Pace fret (Fig. 305) may be taken to represent

the period between 1630 to 1660. The crossed dolphins came into use about 1650, and were a favourite pattern from then as long as lantern clocks were made. J. Michell of Chardstock, a village in



FIG. 304.

Somersetshire, was an excellent maker of lantern clocks about 1700, and judging from the number of specimens still existing, he must



FIG. 305.—The fret of Thomas Pace at the Crown.

have had a considerable connection. His frets were good and bore a distinctive character. The one shown in Fig. 307 is from a clock in the possession of Mr. S. Good, Seaton, Devonshire. Frets similar to

Fig. 308 are found upon later specimens, particularly those made in the Eastern Counties.

Captain Edward Lethbridge has a clock of the kind referred to as being a transition between the brass-cased lantern and the wooden



FIG. 306.—Dolphin fret.

long case. It is by Tristle of Williton, a village in Somerset. The movement stands on a mahogany bracket, and is protected by a hood of the same material having a carved top. It requires winding twice



FIG. 307.—Fret of J. Michell, Chardstock.

a week. The dial measures about 7 inches across, and has an arched top with a figure of Time and the motto "Tempus fugit." There is an alarm, but no other striking work. It has a long pendulum swinging in the open air below the bracket, where also hangs the

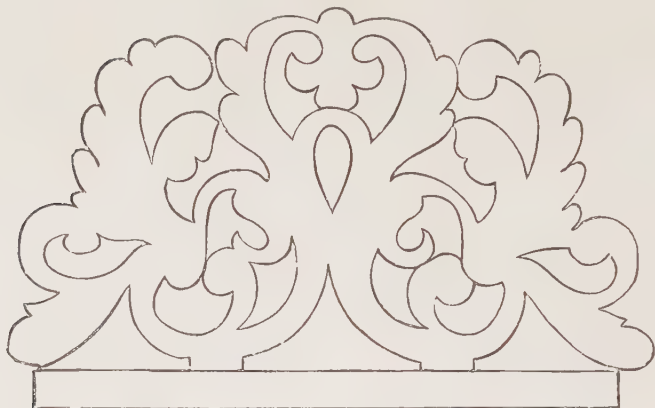


FIG. 308.—Late period fret used in the Eastern Counties.

cord from which the driving weight depends. The date of its production would be, I should think, about 1720. Mr. W. T. Harkness has one by "Payne, Hadleigh," of the same period, the hood of which is mahogany.



FIG. 309.

An earlier hood clock is shown in Fig. 309 by favour of Mr. Percy Webster. It is of the kind known as "Friesland," and though clocks of this pattern were, I think, not made in England, they are of interest as an early application of a pendulum longer than the case. Through the hole in the bottom of the bracket the pendulum bob, in the form of a man on horseback, is visible as it vibrates. There are two bells, the completion of each hour being marked by strokes on the large bell, while the same number of blows given on the small bell denotes the succeeding half-hour.

Lantern clocks were made long after the long case was introduced. Indeed, one occasionally sees an

adaptation of the bedpost movement to the needs of the later construction, the two trains being placed side by side to allow of winding with a key from the front, but with six pillars instead of the more simple and convenient back and front plates.

Then, in the old four-post Dutch movements, made at the beginning of the last century, a long while after the adoption of the pendulum, the crown wheel and verge were retained in a vertical position, and the pendulum was suspended above the movement at the back of the case, quite detached, and connected with the escapement only by means of a light wire crutch, working horizontally over the frame. Owing to this peculiarity, clocks of such a construction are often supposed to be much older than they really are, especially if, as occasionally happens, the pendulum gets removed or lost; for when this occurs, the remaining part of the movement almost identically resembles the drawings of De Vick's clock.

Another instance of the slow appreciation of improvement is the very gradual acknowledgment of the minute hand. Clocks with an hour hand only were produced by country makers till quite the end of the eighteenth century.

LONG-CASE CLOCKS.

Towards the close of the reign of Charles II. the brass chamber clock with a wooden hood developed into the long-case eight-day variety now familiarly termed "grandfather," and veritable specimens of that period, though rare, are occasionally to be seen. In the earliest the escapement was governed by either the two-armed balance with weights or by a "bob" pendulum; the long or "royal" pendulum came into general use about 1680.

Some of these primitive "grandfathers" were exceedingly narrow in the waist, only just sufficient width being allowed for the rise and fall of the weights. A curious addition to these cases is sometimes seen in the form of wings or projections on each side of the waist, to permit the swing of a "royal" pendulum. Sheraton seems to have suggested a revival of these wings in the case shown in Fig. 341. As the conversion was a simple process, it is now very difficult to meet with an example having the original balance escapement.

But for a few exceptions that mark the rule, long-case clocks have the movement contained between two brass plates held together by horizontal pillars. This change came with the rearrangement of the

trains side by side, to allow of winding with a key from the front of the dial. The earliest were small in size, with square dials, and had no door to the hood, which had consequently to be taken off completely before the clock could be wound. The cases were frequently covered with marqueterie work of more or less artistic merit, most likely the production of the many Dutch artists who were settled in London at that time. Corkscrew pillars at the angles of the hood were also a distinguishing mark of the period, and were often used in the reign of Queen Anne. Sometimes these cases had a bull's-eye of bottle-glass let in the door opposite the pendulum bob, causing a peculiar appearance as it swung to and fro, the bob being magnified and distorted in appearance when seen through the glass.

The hour circles on the dials have many distinguishing marks. In the earliest specimens, before the adoption of the minute hand, the double circles within the numerals, as seen in lantern clocks, are retained; and between them the hour is divided into quarters, the half-hour being shown by a longer stroke, terminating in a *fleur-de-lys* or similar ornament. With the minute hand and double outer circles the divisions on the outer edge had, besides the numerals denoting the number of minutes, a cross or dagger marking the half-quarters. There was no lack of engraving on the early dials, especially on those of the William III. and Queen Anne periods. Around the edge was often a "herring-bone" or laurel-leaf border, and on the "matting" in the centre something in the form of birds and foliage bordered the aperture showing the day of the month; this had a very good effect when burnished bright in contrast to the matting. Further relief was given by turning a number of rings around the winding holes. On the early clocks of the seventeenth century the maker's name will be found in Latin under the circle on the bottom of the dial, thus, "Henricus Jones, Londini, fecit;" later it was engraved on the circle between the figures VII and V. About 1715 name plates appear to have been first used, and individual makers used their own discretion in the matter, the Latin inscription going out of use excepting for such popular mottoes as *Tempus fugit*, *Tempus edax rerum*, etc.

Fig. 310 represents a very early square engraved metal dial which is of particular interest not only from its handsome appearance, but from the fact that it discloses a peculiar plan of denoting the minutes. The short hand in the centre of the dial is the alarm index, which need not be referred to further. The hours and sub-

divisions representing quarter hours are engraved on the dial plate in the manner usual at the middle of the seventeenth century, and the hours and quarters are indicated by a pointer fixed to a plate of the form shown, and which revolves once in twelve hours. The revolving plate includes an outer ring connected with the centre by three arms, and projecting from the outer edge of this ring are twelve pointers placed equidistantly around the periphery. On the upper part of the fixed dial plate is a narrow band forming 30 degrees, or one twelfth of the circumference. This band is divided into 60 equal parts, representing the minutes in an hour; and if at the beginning of an hour one of the pointers is just entering this arc, it is obvious it will in its course indicate the minutes which have elapsed since the completion of the previous hour.

At the bottom of the dial is inscribed, "William Clay, King's Street, Westminster," and this William Clay was probably the one recorded as the maker of a watch presented by Cromwell to Colonel Bagwell at the siege of Clonmel. This dial was sketched from a clock in the possession of Mr. Percy Webster.

The addition of an arched top to the dial was a great improvement to its appearance. It is first seen in some of Tompion's later clocks, and was very generally adopted for the better class of work in the time of George I. Old square dials will often be found to have had the arch added, the square and arch being made in separate pieces and riveted together. The idea may have come from the old lantern clocks, for the form and decoration of the arch resemble the fret at the top in front of the bell, which was used in some of them, especially those with the favourite dolphin pattern. Why the old clockmakers were so attached to this conventional device does not appear to be recorded, but dolphins were for a long time retained as an ornament to the arch dial, one being engraved on each side of a domed plate on which was inscribed either the owner's or the maker's name, occasionally with a crest or

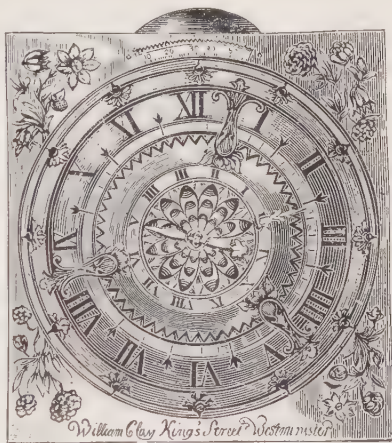


FIG. 310.

motto. The strike-silent hand was probably introduced by Quare, and is to be seen on some of his clocks with square dials. A form of the device was incorporated in a patent granted to John Rowning, M.A., in 1732 (No 535).

During the latter part of the eighteenth century there was a great taste for moving figures placed in this part of the dial, such automata as see-saws, heaving ships, time on the wing, etc., being especially favoured. The Dutch especially excelled at this kind of work.

The date of the introduction of plain silvered and painted dials

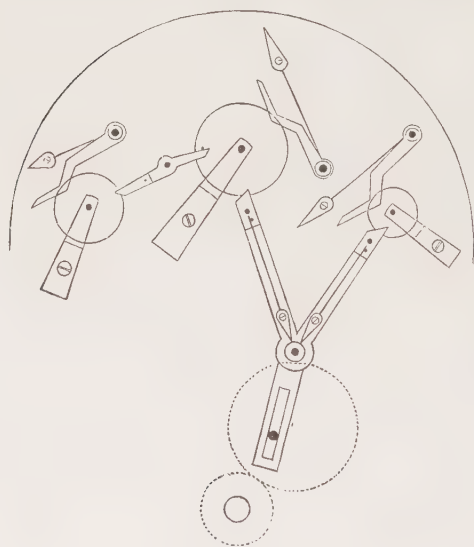


FIG. 311.—Simple calendar work.

as shown in Fig. 311. Gearing with the hour wheel is the wheel having twice its number of teeth, and turning therefore once in 24 hours. A three-armed lever is planted just above this wheel; the lower arm is slotted, and the wheel carries a pin which works in this slot, so that the lever vibrates to and fro once every 24 hours. The three upper circles in the drawing represent three star wheels. The one to the right has seven teeth corresponding to the days of the week; the centre one has thirty-one teeth for the days of the month; and the left-hand one has twelve teeth for the months of the year. Every time the upper arms of the lever vibrate to the left, they move forward

may be put down as about 1780; those having engraving instead of matting in the centre are earlier, and will be found on clocks made from about 1740. Thomas Bewick, the celebrated engraver who died in 1828 at the age of 76, was apprenticed to Bielby of Newcastle, and during his apprenticeship was frequently engaged in engraving clock dials.

Calendar circles in the arch of the dial were very popular. The hands for these were generally worked

the day of the week and day of the month wheels each one tooth. The extremities of the levers are jointed, so as to yield on the return vibration, and are brought into position again by a weak spring, as shown. There is a pin in the day of the month wheel which, by pressing on a lever once every revolution, actuates the month of the year wheel. This last lever is also jointed, and is pressed on by a spring, so as to return to its original position. Each of the star wheels has a click or jumper kept in contact by means of a spring.

For months with less than 31 days the day of the month hand has to be shifted forward.

The phases of the moon, usually accomplished by a disc turning



FIG. 312.



FIG. 313.



FIG. 314.

once in two lunations, as shown in Enderlin's clock on page 254, was also a favourite device for the arch of the dial.

The spandrels or corners outside the circle of the dial are another sign of the times. The very early long-case clock shown in Fig. 319 had these corners filled each with a line of verse, but more usually these spaces were occupied by raised gilt ornaments. Of these the earliest were the cherubs' or angels' heads, Fig. 312. This pattern will be seen on the clock represented in the coat-of-arms granted to the Clockmakers' Company in 1671, and was largely used until the end of the century. It was succeeded by larger and more elaborate corners like Fig. 313. Then more ambitious designs came into use, notably two Cupids or nude boys supporting a crown in the midst of ornamental scroll-work (Fig. 314); or a crown with crossed

sceptres and foliage, as in Fig. 315. This is an unusually fine specimen taken from a clock by W. Draper, *tempo* Queen Anne. About this period different figures representing the four seasons



FIG. 315.

were popular with some of the country makers, but they are seldom to be seen on clocks by London men. These well-known patterns were followed later in the eighteenth century by various combina-



FIG. 316

tions and those of a rococo character, such as Fig. 316, until we come to the degenerate patterns of the George III. period (Fig. 317), when many were rough castings never touched by a chasing tool



FIG. 317.

after leaving the sand. Traces of water-gilding will often be found on those first made, clearly showing that such clocks were only for the wealthy.

Soon after the pendulum was introduced, concentric minute

hands were commonly applied, although one-hand clocks continued to be made to a much later date, especially by makers in country districts.

Occasionally, on clocks of a high class, silver corner pieces pierced and engraved were substituted for the set patterns.

The hands on eight-day clocks of the William III. period are most artistic, not only being elaborately pierced, but also carved and shaped on the surface.

The splendid dial and hands by Daniel Quare shown in Fig. 318,

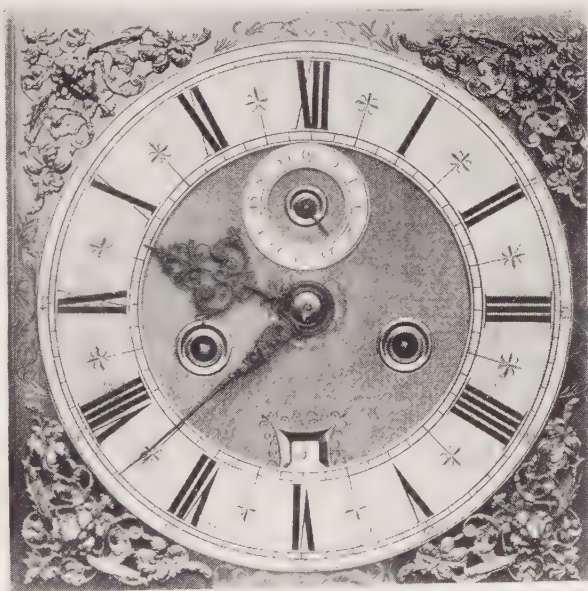


FIG. 318.—Dial of clock by Daniel Quare.

and for which I am indebted to Mr. H. Cook of Newark, are worth examination.

The success of eight-day movements induced clockmakers to calculate trains to go for a month and even a year, of which there are several examples by Tompion and Quare.

It will be noticed in the striking part of the eight-day clocks made before the invention of the rack, about 1675, the locking-plate or count wheel was on the outside of the pillar plate; those fixed on the great wheel, though later, cannot be dated from any particular period. When the rack was first introduced it was placed

between the plates and lifted by a pin in the arbor, instead of a gathering pallet. This method does not seem to have been used later than 1700, the outside rack being found so much more convenient.

As material for the cases, oak has been used from first to last, but rarely for high-class work. Walnut cases, both plain and inlaid, were largely made during the latter part of the seventeenth and beginning of the eighteenth centuries. Numbers of cases with the English copy of quaint-looking Japanese or Oriental lacquer-work were made about 1745, but the most highly prized cases are those of mahogany in the Chippendale and Sheraton styles, inlaid with satinwood, etc.

By favour of Messrs. Horne and Son, of Leyburn, I am able to give an engraving of a very early specimen of a long-case clock. This quaint timekeeper was sold by them some years ago to the present owner, Mr. Thomas Bradley, Bearpark, Wensleydale, with an agreement that it should never go out of the dale. This case is of oak and panelled. The head is fixed on the trunk, and will not take off. Two slip doors at the sides of the head open to get to the works, and a sash door affords the same convenience for the dial. Both the case door and the sash door open from right to left. The initials E. F. M. with date, 1681, are carved on the case and also on a carved panel on the head. The clock was made for Edward and Margaret Fawcett; the former was a clergyman, who lived at Hardraw, close to the beautiful Hardraw Waterfall. The works are of the lantern type, with a large bell and hammer inside, and small dial as shown in Fig. 310. It was made by John Ogden, Bowbrigg (c). In Ogden's clocks of later date the name of the place was spelled Bowbridge, but the local name is Bowbrigge to-day. In each of the corner spaces outside of the hour circle is engraved one line of the following verse:—

" Behold this hand,
Observe ye motion tip;
Man's precious hours
Away like these do slip."

John Ogden was a member of the Society of Friends, and a great friend of George Fox, who often visited Wensleydale.

As an example of the better class of early long-case clocks, a drawing of a very fine specimen, with marqueterie case, which is in the Dean's Vestry, St. Paul's Cathedral, is given in Fig. 320. The date of this can be well authenticated by the following

extract which I have been allowed to make from the Cathedral accounts for the period from October, 1697, to September, 1698, when the clock was paid for :—

“ffor a pendulum Clock for the South East Vestrey that goes 8 dayes in a Walnut Tree inlaid Case £14 00 00.”

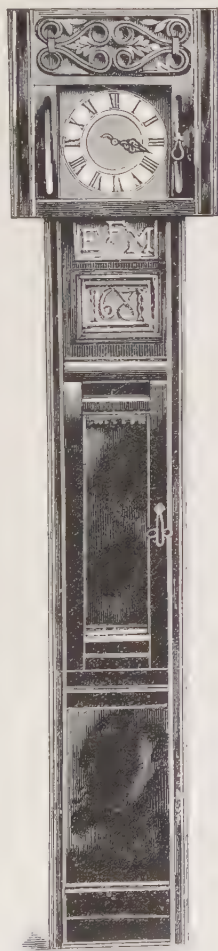


FIG. 319.

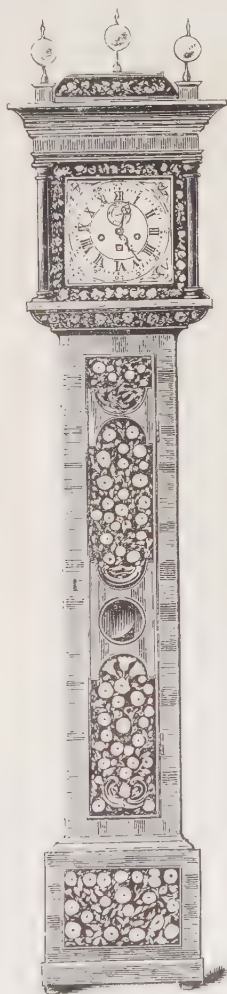


FIG. 320.

It will be noticed that the case has the characteristic domed or canopied top resembling in outline the basket-work on old bracket clocks. There is no maker's name on either the dial or movement,

but it was doubtless the production of Langley Bradley, who was at that time the Cathedral clockmaker.



FIG. 321.
Clock by "George Ethrington, London," fine English marqueterie case, about 1690.



FIG. 322.
Tompion clock at Windsor Castle.



FIG. 323.
Long-case clock by Tompion, about 1700.

A very fine chiming clock by Tompion, with canopied head, which is at Windsor Castle, is shown in Fig. 322.

On this page is shown another clock by Tompion, Fig. 323, dating from about 1700; it is the property of Mr. John T. Trotter of

Hexham. The case is of oak veneered with walnut, and has a rather tall plinth and narrow body ; on each side of the dial is a



FIG. 324.—Tompion one year time-piece at the Admiralty.



FIG. 325.—Oriental lacquer-work carved dark oak case, about 1740.

spirally fluted pillar, a kind of embellishment much favoured at the period, and a handsome carved ornament surmounting the

entablature. The clock is in perfect order, and Mr. Trotter speaks of the hands as the finest pair he has ever seen. Fig. 324 represents an exceedingly fine Tompion one-year timepiece which is now at the Admiralty. The hours are marked twice from I to XII, and at the top of the hood is the inscription, "Presented by Queen Anne." It was probably intended for Greenwich Observatory. A very similar twelve-month timepiece by Tompion, in the possession of the Royal Society, is inscribed, "Sir Jonas Moore caused this movement to be made with great care, Anno Domini 1676." It was presented to the Society in 1736.

or the formation of designs by inlaying wood of **Marqueterie**, different kinds, is a very ancient art. The Italians particularly excelled at it during the fifteenth and sixteenth centuries. Some of the earliest long-case clocks were liberally embellished with marqueterie in fine geometrical patterns after the Italian style and various floral designs. A more pronounced taste for marqueterie seems to have occurred when William of Orange ascended the English throne. Probably his followers included Dutch inlayers who settled here. Dutch marqueterie is effective, of a distinctly bolder or coarser character and, as a rule, may be distinguished from English work which more favours the Italian style. Soho seems to have been a favoured district for marqueterie workers, though Tonbridge in Kent and St. Ives and other smaller places in Cornwall are spoken of as being famous for marqueterie work in the eighteenth century. Early examples of English marqueterie may be seen on pages 318, 319. The clock shown in Fig. 321 is the property of Mr. Thomas Boynton of Bridlington Quay, and was made by George Ethrington, London, about 1665. A pretty specimen of later date is shown in Fig. 326. The clock looks like a production of about 1725, but the case is of a nondescript character and probably of half a century later.

Dark oak cases carved in high relief do not seem to have been the fashion of any particular period, but the result rather of occasional efforts by enthusiastic artists in wood, and then in most instances they appear to have been made to enclose existing clocks in substitution for inferior or worn out coverings. Of the fine specimen shown in Fig. 327, I was favoured with a drawing by the owner, whose name I have unfortunately mislaid. The maker of the clock was Thomas Haden, and it possibly dates from about 1720, but to assign a date for the case would be mere guess work; its outline is characteristic of the Chippendale period. An unusually fine

specimen of a square-headed clock-case with the Oriental lacquer-work decoration in relief, is shown in Fig. 325. The clock, which

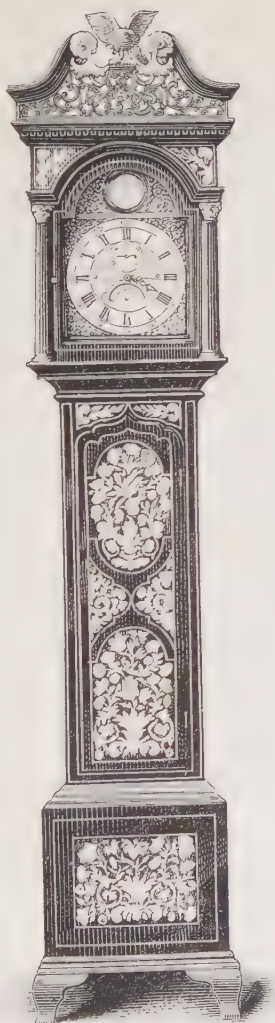


FIG. 326.



FIG. 327.—Carved dark oak.

was in the possession of Mr. John T. Trotter, is by Anthony Marsh, who was free of the Clockmakers' Company in 1726, and it may be assumed to have been made about 1740.

Examples of what is generally accepted as an **Chippendale**. orthodox Chippendale case are represented on this page. It is not easy to define exactly what constitutes a Chippendale case, nor why cases of this pattern should be ascribed



FIG. 331.—Reputed Chippendale case, enclosing a fine clock by Richard Vick at Windsor Castle.



FIG. 332.—Reputed Chippendale case.



FIG. 333.—Chippendale.

to Chippendale. Thomas Chippendale was a noted upholsterer and cabinet-maker in St. Martin's Lane. He published a splendid folio book of designs, of which three editions appeared between 1755 and 1763. Figs. 333, 334, 335 and 336 are copied from his work by favour of Mr. B. T. Batsford. It must be confessed none of them bears a very close resemblance to the reputed Chippendale patterns.



FIG. 334.—Chippendale.

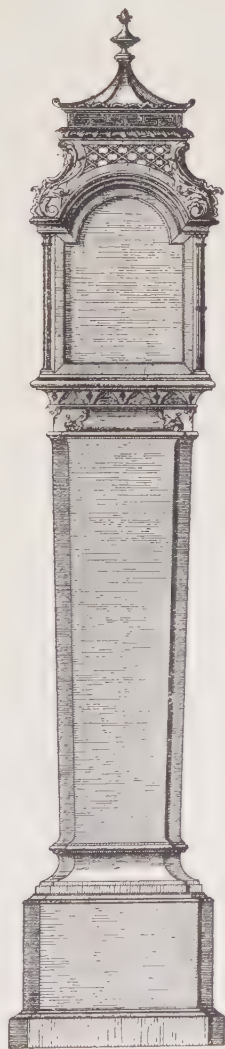


FIG. 335.—Chippendale.

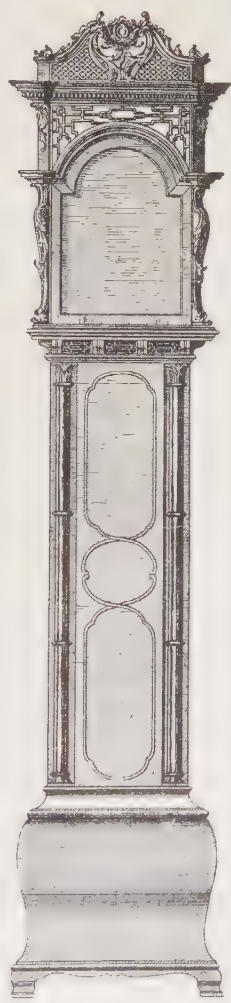
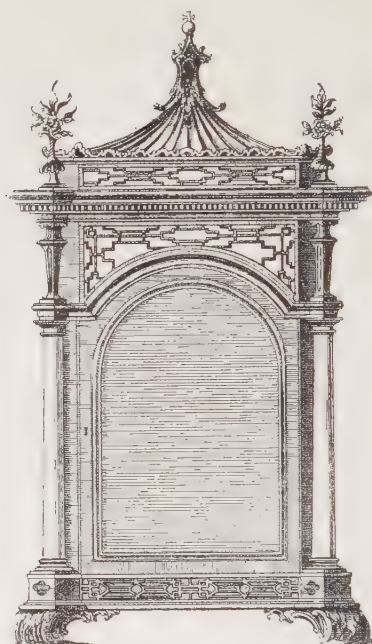
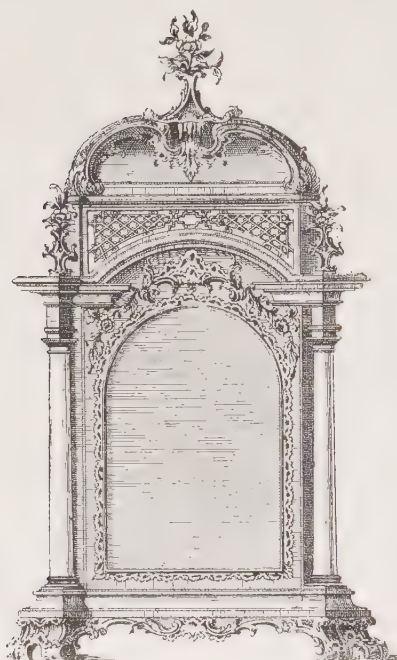
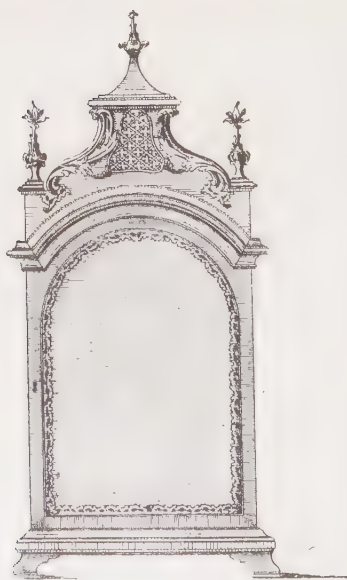


FIG. 336.—Chippendale.



FIGS. 337, 338.—Chippendale bracket cases.



FIGS. 339, 340.—Chippendale bracket cases.

There are also representations of two other long-case clocks, the bracket-clock cases shown in Figs. 337, 338, 339 and 340, a cartel case, and two other small wall timepiece cases. The two long cases I have not reproduced are carved very much in the French style, as Figs. 250, 251, delineated on page 270. The characteristics of the cases now generally known as "Chippendale" are the pillars or pilasters rising at the front corners of the case, from the plinth to the entablature under the hood, and the corresponding pillars at the front corners of the hood. Generally the bases and caps are of metal, and the shafts fluted. The case is much higher than the dial, and may be of the pattern shown in Figs. 331 and 332, which is considered the more correct, or of the horn-top kind, in which the upper part terminates in two carved "horns," curving inwards. It will be observed that the head above the dial in Fig. 331 is high, and most after the style of Chippendale's drawings. This clock is by Richard Vick and is at Windsor Castle.

In 1803 was published "*The Cabinet Dictionary*," **Sheraton.** by Thomas Sheraton, of which another edition appeared in 1808. No mention is made of clock cases in the first edition of this work. From the later edition are copied Figs. 341 and 342. Though rarely made in this form with square dials, the ornate style and beautiful inlaid work associated with Sheraton have been very successfully applied by clock-case makers, and the popularity of Sheraton cases has never declined. It is said that Sheraton was Chippendale's foreman.

The handsome clock shown in Fig. 343 was made by Ainsworth Thwaites for the East India Company about 1770; the case is of handsomely figured wood, doubtless of Indian growth. A companion case, which originally held a dial to record the direction of the wind, seems to have mysteriously disappeared from the offices of the Company, and to have been found on the Continent, where it was purchased by an official of the English Government, and the two now appropriately occupy positions in a room at the India Office, being symmetrically placed one on each side of the fireplace.

Fig 344 represents a long-case clock of novel design by William Dutton, Fleet Street, and dating from about 1780, for which I am indebted to Mr. Thomas Wyatt. The case, just upon ten feet in height, is of pine and mahogany enamelled light blue and white. The dial is of brass with a convex enamelled centre. The movement has a dead beat escapement and a gridiron compensated pendulum. The lunar ball in the arch of the dial is rotated from the

hour wheel arbor, on which is cut a screw to drive the intermediate lunar train. Below the moon is an oblong slit through which appears the day of the month.



FIGS. 341, 342.—Sheraton cases.

As examples of the plain early nineteenth-century clocks of the best class with circular enamelled dials, and usually in cases of mahogany with finely figured surfaces, may be taken the one by Vulliamy illustrated on page 244, and one by Recordon shown in Fig. 345.

The introduction of cheap American clocks was disastrous to the old English ones, and between 1850 and 1860 thousands of good



FIG. 343.—Timepiece
by Ainsworth Thwaites
at the India Office.



FIG. 344.—Clock by
William Dutton,
about 1780.



FIG. 345.—Clock at Windsor
Castle by Recordon.

serviceable long-case timekeepers were sacrificed, the cases being chopped up for firewood and the substantial brass movements consigned to the melting-pot.

BRACKET OR PEDESTAL CLOCKS

Bracket or pedestal clocks, with enriched cases, as distinguished from the plain metal covering of the ordinary chamber clock, were in favour before the advent of the long-case variety.

Of the early types with metal cases, examples have already been



FIG. 346 (C. 17).

given. During the latter part of the seventeenth and the beginning of the eighteenth century the square "sugar" case of wood with a perforated metal top, chased and gilt, called basket-work, surmounted by an enriched handle, was very popular. An engraving of this variety is given on page 171.

With the introduction of the arched dial came the "bell" shaped case, so called from the hollow curved character of the top. Two

views (Figs. 346 and 347) are appended of an early specimen belonging to Mr. Schloss, which was made quite at the beginning of the eighteenth century by Jeremiah Hartley of Norwich. The case is of ebonized wood with brass mounts. In the spandrels of the arch and at the sides is pierced diaper work backed by silk, to permit the sound of the bell to escape and yet prevent the ingress of dust. The

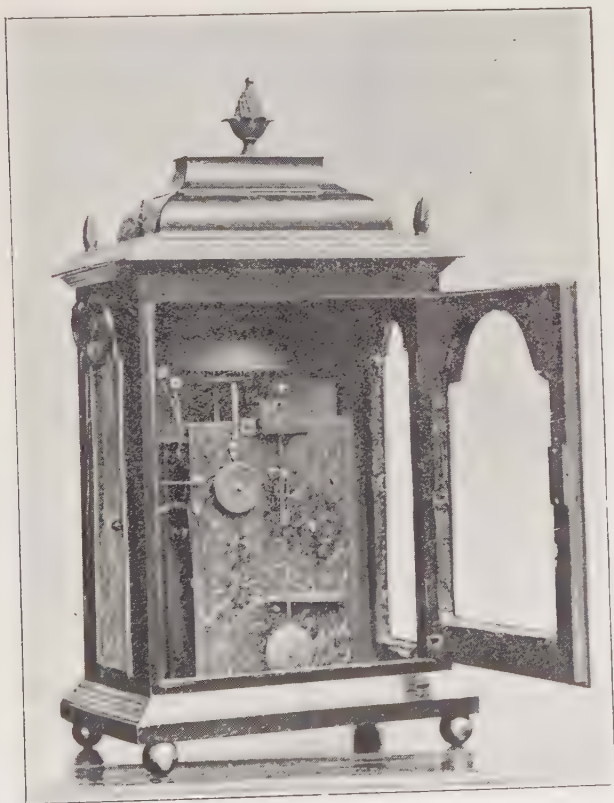


FIG. 347 (A S).

engraving of the dial and the back plate is very fine indeed, and the work throughout is really admirable. The clock shows days of the month, strikes the hours and quarters, and the strokes corresponding to the previous striking may be repeated at pleasure by pulling a string terminating in the knob which is seen at the right of the front view. In the arch of the dial is a rise and fall regulator which adjusts the length of the pendulum.

A later bell-top case with fine claw feet, and surmounted by a plain brass handle instead of the side handles, is shown in Fig. 348. From the presence of the strike-silent hand, one may place the date of this at about 1740.

Of the more ornate styles in vogue during the second quarter of the eighteenth century, the clock by Graham on page 187 affords a good idea.

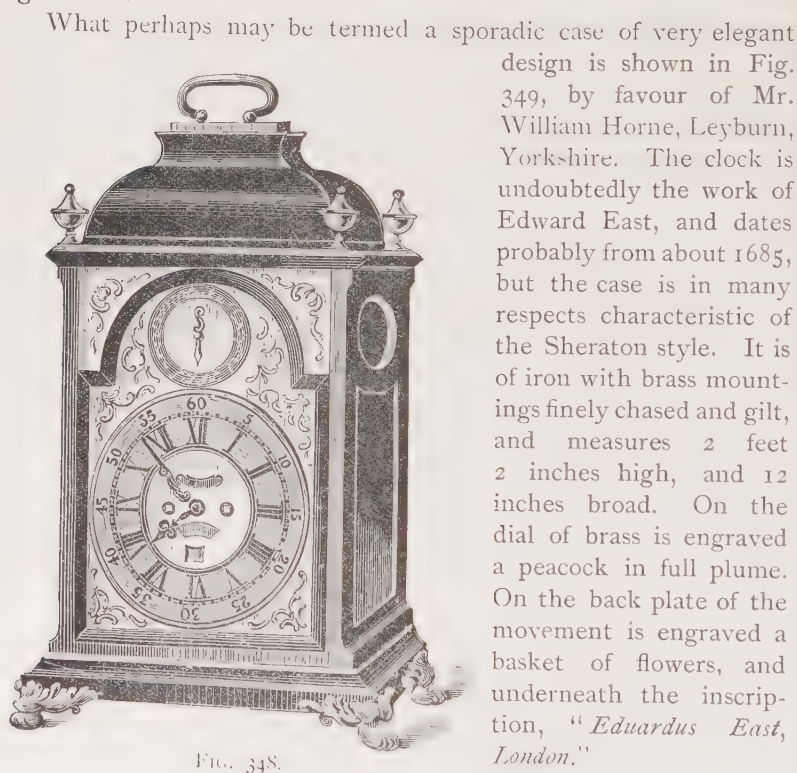


FIG. 348.

What perhaps may be termed a sporadic case of very elegant design is shown in Fig. 349, by favour of Mr. William Horne, Leyburn, Yorkshire. The clock is undoubtedly the work of Edward East, and dates probably from about 1685, but the case is in many respects characteristic of the Sheraton style. It is of iron with brass mountings finely chased and gilt, and measures 2 feet 2 inches high, and 12 inches broad. On the dial of brass is engraved a peacock in full plume. On the back plate of the movement is engraved a basket of flowers, and underneath the inscription, "*Eduardus East, London.*"

Towards the end of the eighteenth century the popularity of the "bell-top" case waned, and it was gradually supplanted by three set patterns, the "broken arch," the "balloon," and the "lancet."

The "broken arch" was not, as might be supposed, a circular pediment cut away in the middle, but an arched top not extending to the full width of the dial, the moulding surmounting the arch being continued from its springing along the front of the case in two short straight bands. This seems to have been taken from Chippendale's bracket cases, as in Figs. 337, 338, 339, 340, all of

which have circular pediments of this kind, but the ornamental superstructure as suggested by Chippendale was not adopted. What is generally accepted as a "broken arch" case is, by favour of Mr. Percy Webster, shown in Fig. 350. It enclosed a clock

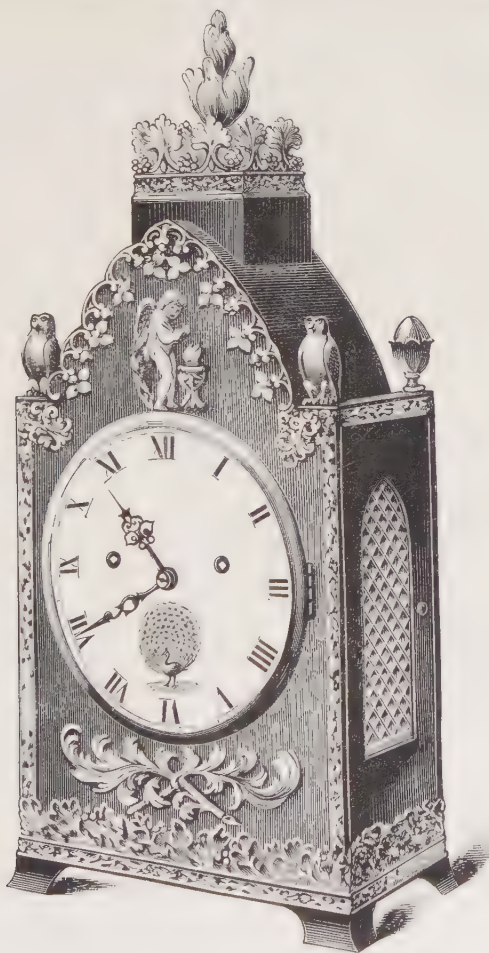


FIG. 349.

dating from about 1790, by John Thwaites, an eminent maker who was several times master of the Clockmakers' Company.

A wide broken-arch mahogany case, containing a musical clock by Stephen Rimbault, is shown in Fig. 351. The clock plays six tunes on eleven bells. One air is "God Save the King"; the others are now

obsolete and not easily recognized, but no doubt they were most popular about 1780, when the clock was made.

Rimbault carried on business in Great St. Andrew's Street, St. Giles, and was a maker of repute, particularly excelling in clocks with mechanical figures dancing or working on the dials, and other complicated timekeepers. The artist Zoffany was for some time Rimbault's decorative assistant, and in him his master had a man of great ability and taste, who no doubt helped to make his name.



FIG. 350.

Zoffany painted a portrait of his master which pleased Rimbault so much that he introduced him to Wilson, the portrait painter. Zoffany was then employed by Wilson to fill in draperies, etc., at a salary of £40 a year, and while with him his ability was recognized by David Garrick, who put him into the channel of theatrical portraiture, where he made his name, becoming R.A. in 1768.

A very excellent example of a "balloon" case and bracket is given in Fig. 352, for which I am indebted to Mr. Webster. They

were generally plain in outline, and inlaid after the Sheraton style, but their beauty really lay in the graceful harmony of the curves constituting the case and bracket which together formed a complete and pleasing design. The clock enclosed in this case was made by Robert Wood, of Moorfields, about 1790. The round knob on top



FIG. 351.—Chiming clock by Rimbault (A S).

of the case served to regulate the time by shortening or lengthening the effective part of the pendulum.

In Fig. 353 is a later and more ornate form of balloon clock at Windsor Castle. Its appearance is somewhat disappointing, for without a bracket this style of case is shorn of its beautiful outline.

The "lancet" case, in the form of a pointed Norman or Gothic

arch, and named from its resemblance to the well-known cutting instrument used by surgeons, is shown in Fig. 354. This clock, dating from about 1820, was made by George Orpwood. Ornamental engraving on the back plate, which characterized all the best

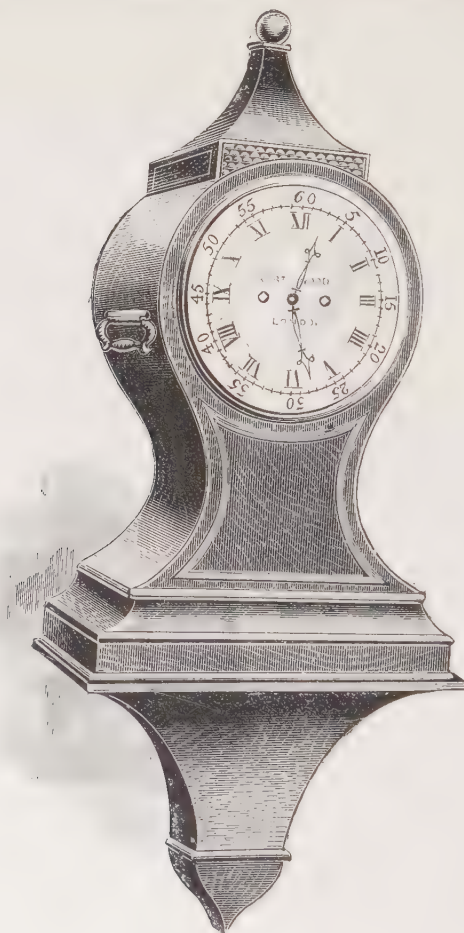


FIG. 352.

bracket clocks up to the end of the eighteenth century, is rarely seen on nineteenth-century productions. With the engraved plate disappeared, of course, the glazed door at the back of the case. The utilitarian spring, which abolished these features as redundant, has however caused fine specimens which survive to be more highly

prized. What can look meaner than the bare and often common wood at the back of many pretentious modern clocks if one of them happens to be in front of a mirror.

Soon after its introduction, the pendulum was occasionally placed outside of the case in front of the dial, especially in small clocks like Fig. 173, but I saw a very fine bracket clock arranged in this way. It was by John Trubshaw, of London, and dated from about 1700. To put the pendulum outside is not a good

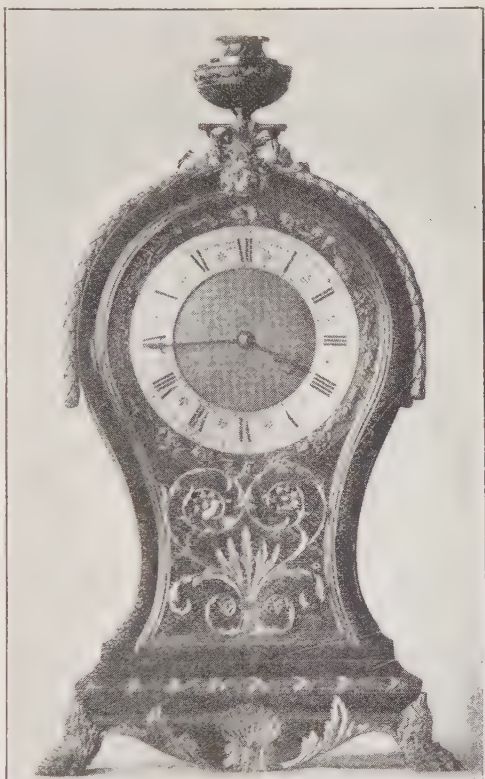


FIG. 353.

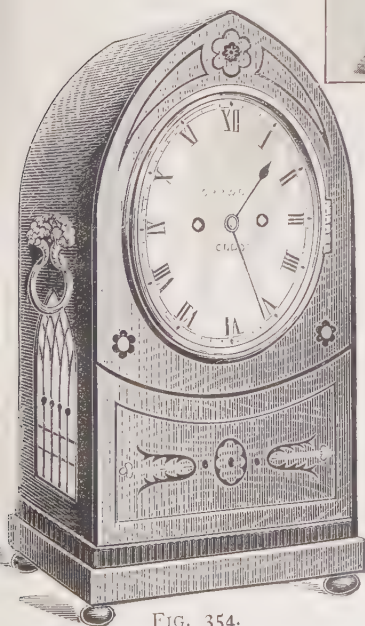


FIG. 354.

plan, for it is clearly more liable to disturbance than when suspended inside the case. Captain Edward Lethbridge informed me that in the hall of Hinton Ampner House, near Alresford, is a timepiece, probably of French origin, in an oval case of embossed silver measuring about 20 inches by 12 inches, mounted on a velvet block. The pendulum reaches from the top to the bottom of the case, and swings in the front on the outside of the dial. This also would probably be a very early eighteenth-century production.

**Taxes Relating
to Clocks and
Watches.**

Legislation has on more than one occasion affected the material used for watch cases. In 1719 a duty of sixpence an ounce was imposed on articles of silver, and this quickly led to an increased use of base metal cases. In 1758 an annual payment of forty shillings by dealers was substituted for the duty, and in 1759 the amount to be paid for a licence was raised to £5. But in 1784 the duty of sixpence per ounce was reimposed in addition to the dealer's licence. The effect was remarkable; the use of silver immediately declined, and for the next fourteen years large numbers of base metal cases were made. In 1797 a tax of eight shillings an ounce was levied on gold articles, which doubtless would have led to an increased use of silver gilt and pinchbeck cases, but that Pitt, not content with taxing the cases, at the same time imposed a tax on all persons in respect of the possession and use of watches as well as clocks. The Act ordained that—

“For and upon every Clock or Timekeeper, by whatever name the same shall be called, which shall be used for the purpose of a clock and placed in or upon any dwelling house, or any office or building thereunto belonging, or any other Building whatever, whether private or publick, belonging to any person or persons, or Company of Persons, or any Body Corporate, or Politick, or Collegiate, or which shall be kept and used, by any Person or Persons in Great Britain, there shall be charged an Annual Duty of Five Shillings. For and upon every Gold Watch, or Watch enamelled on Gold, or Gold Timekeeper used for the Purpose of a Watch by whatever Name the same shall be called, which shall be kept, and worn, or used, by any Person or Persons in Great Britain, there shall be charged an Annual Duty of Ten Shillings. And for and upon every Silver or Metal Watch, or Silver or Metal Timekeeper used for the purpose of a Watch or any other watch, or Timekeeper used for the like purpose, not before charged, of whatever materials the same shall be made, and by whatever name the same shall be called, which shall be kept and worn, or used, by any Person, there shall be charged an Annual Duty of Two Shillings and Sixpence.”

It requires an effort to realize that such an impost prevailed here less than a century ago. Among other provisions of the Act was one declaring that every watch or clock maker or dealer in the cities of London and Westminster, the parishes of St. Marylebone and St. Pancras, the Counties of Middlesex and Surrey shall pay

an annual duty of two shillings and sixpence. In any other part of the country such a maker or dealer was let off by paying a shilling duty.

The produce was far from reaching the estimated yield, while the operation of the tax was such as nearly to ruin manufacturers. The demand for clocks and watches decreased to such an extent, that in less than a year the general manufacture of these articles in the kingdom, and the various branches of trade connected therewith, had diminished by one-half, and thousands of persons were deprived of employment. It is not therefore surprising that the Act was repealed in April, 1798.

A writer in *Notes and Queries* mentions that he met with a printed form of receipt for a half-year's taxes, due from a small farmer in Essex, in which occurred the item, "For clocks and watches, 5. 7½." The receipt was dated April 10th, 1798, the month in which the Act was repealed.

Although the imposition of this obnoxious tax paralyzed the horological trades, it had the effect of creating one new kind of timekeeper; for tavern keepers, anticipating a scarcity of timekeepers among individuals, with one mind seem to have adopted a bold mural time-piece for the benefit of those who visited their public rooms. These "Act of Parliament clocks," as they were called, had a large dial of wood, painted black, with gilt figures, not covered by a glass, and a trunk long enough to allow of a seconds pendulum. In country inns an Act of Parliament clock may still occasionally be seen. The appended illustration (Fig. 355) is from a specimen at Windsor Castle.

Watchmakers obtained from Parliament in 1798 some little

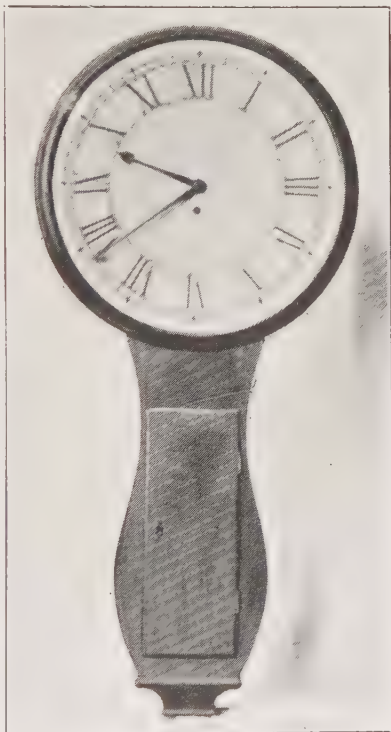


FIG. 355.—"Act of Parliament" clock.

recompense for the dire extremity to which they had been reduced, for from that time watch cases have been exempt from the plate duty. But watch manufacturers had nevertheless to continue the annual plate licence, although watch case makers were absolved from the necessity of doing so.

In 1803 the licence underwent further alteration ; for trading in gold over 2 dwts. and under 2 oz., or in silver over 5 dwts. and under 30 oz., an annual payment of £2 6s. was then demanded, and for trading in gold or silver articles above those weights an annual payment of £5 15s.

MECHANISM OF CLOCKS AND WATCHES.

The Pendulum.

It is not certain who first used the pendulum as a controller for clocks. Galileo, the famous astronomer in 1582, remarked the synchronous vibrations of the lamps suspended by long chains from the roof of the cathedral at Pisa, and it is said that when blind he dictated to his son Vincent a method of using the pendulum as a timekeeper, which the latter carried out in 1649. From the drawing of this contrivance it seems to have been merely a train of wheels and a rude escapement to keep a pendulum in motion, in order to determine the time by counting its vibrations. It is shown in Fig. 356, and a working model of it is to be seen at South Kensington Museum.

In the Vienna Treasury is a clock dating from the early part of the seventeenth century. This is furnished with a pendulum which it is contended was invented by the maker of the clock, J. Burgi, of Prague, who was appointed as clockmaker to Rudolph II. in 1602.

Then it is stated that Richard Harris constructed a turret clock with a pendulum for the church of St. Paul's, Covent Garden, which has since been burnt down. The authority for this statement rests chiefly on an engraved plate affixed in the vestry-room of the old church, with the following inscription on it :—

“The turret clock and bells of this church were made A.D. 1797, by Thomas Grignon, of Great Russell Street, Covent Garden, the son and successor of Thomas Grignon, who (A.D. 1740) brought to perfection what the celebrated Tompion and Graham never effected, viz. the horizontal principle in watches and the dead beat in clocks, which dead beat is a part of the mechanism of the turret clock.

Thomas Grignon, senior, made the time-piece in the pediment at the east end of this parish church, destroyed by fire A.D. 1795. The clock fixed in the turret of the said church was the first long pendulum clock in Europe, invented and made by Richard Harris, of London, A.D. 1641, although the honour of the invention was assumed by Vincenzo Galilei, A.D. 1649, and also by Huygens in 1657. This plate is here affixed by Thomas Grignon, of this parish, the son of the above Thomas Grignon, as a true memorial of praise to those two skilful mechanicians, his father and Richard Harris, who, to the honour of England, embodied their ideas in substantial forms that are most useful to mankind."

It would be idle to treat this as conclusive evidence in favour of Harris; still it is entitled to consideration, for the elder Grignon alluded to was regarded as a man of integrity. He was a contemporary and friend of James Ferguson, and one of the first members of the Society of Arts, to which society he presented a regulator in the year 1759, which is yet to be seen at the house of the society in the Adelphi. Besides, that Galileo's observation would be followed by the applica-

tion of a pendulum to a clock is only just what might have been expected. The weak part of the claim on behalf of Harris is that his application of a superior controller should have remained a solitary instance for twelve years or so, and have evoked no attention from scientists and others interested in the subject.

Huygens, it is certain, studied the action of the pendulum between 1650 and 1655, and demonstrated the fact that the path described as the centre of oscillation should be a cycloid for vibrations of varying extent to be passed through in the same time.

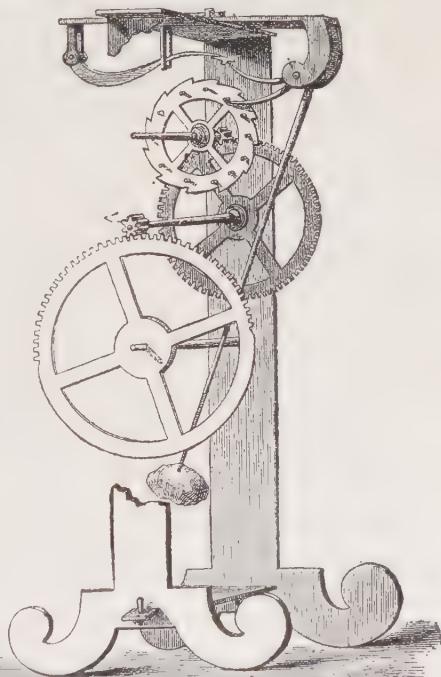


FIG. 356.

Dr. Hooke also saw the advantage of the pendulum about the same time, and proceeded to apply it.

Fromanteel and others have also been named with confidence by their respective admirers as being entitled to the honour of introducing the pendulum; but indisputable proof of any one's claim to originality in the matter there is none, and it is therefore useless to pursue this part of the subject further.

Striking Work.

Recording the completion of each hour by strokes on a bell has always been regarded as an important function of public timekeepers. In some of the early clocks, notably the first one at St. Paul's Cathedral, the sound of the striking was the sole indicator of time provided, and in many later edifices, where the exhibition of dials was considered to be incongruous with the general design, timekeepers similarly restricted have been adopted and their convenience appreciated. Clocks striking the quarters as well as the hours are common enough, but Westminster Abbey furnishes a solitary instance of striking work for the quarters only. This is done, not by the turret clock with the well-known exterior dial, but by the timekeeper in the Poets' Corner, which is also peculiar in being probably the largest spring clock ever made, for the barrels and fusees are each over seven inches in diameter.

Some of the early Dutch and German clocks were furnished with two bells, one larger than the other, mounted on the top of the case. The hour was struck on the larger bell; the first quarter noted by one stroke on the smaller bell; at the half-hour strokes corresponding in number to the previous hour were given on the smaller bell, and the third quarter was proclaimed by one stroke on the larger bell. This plan has the advantage of giving fuller information than modern methods. Where one stroke is given at the half-hour, as in most modern French clocks, half-past twelve, one, and half-past one convey the same unmeaning sound.

As described on page 308, the Friesland hood clocks indicated the half-hour by repeating on a smaller bell strokes corresponding to the hour last completed.

An excellent arrangement for striking on two bells, as carried out by Joseph Knibb, is described on page 204.

Until recently the clock at the church of St. Clement Danes, in the Strand, struck the hour first on a large bell and then repeated the strokes on a smaller one. On account of the roar of traffic along the road, the striking could not be heard except at night, and then

the effect was curious, for the repetition appeared to the uninitiated to be the tardy striking of a clock in some adjacent tower.

Clocks are occasionally to be seen which strike the hours from one to six four times over during the twenty-four hours. In many parts of southern Italy the hours were regularly sounded in this way.

The Japanese had a decidedly ingenious method of sounding the hour and half-hour, which is described on page 298.

Should the present method of splitting the day into two periods of twelve hours each be abandoned in favour of continuous counting of the hours from one to twenty-four, the striking would have to be re-arranged, and the plans just described give a choice for selection.

The earliest device for causing the hours to be struck appears to be the locking-plate construction, as shown in De Vick's clock. A modification of this principle, to ensure greater exactness by using quicker moving parts to unlock the striking-train, is still the most favoured for turret clocks. For house clocks the rack principle invented by Barlow is generally preferred, because in this the striking corresponds with the position of the hands on the dial, whereas with the locking-plate the hours are sounded successively without regard to the hands.

WATCH MOVEMENTS.

Most of the early watches of pocket size were arranged to run for from twelve to sixteen hours between successive windings, the fusee making from ten to twelve turns. The train usually consisted of the great wheel which drove a pinion carrying the second wheel; the second wheel drove a pinion carrying the contrate wheel, and the last named drove the pinion carrying the escape-wheel. The great wheel was fixed to its arbor, one end of which fitted loosely into a long hole in the larger end of the fusee, the other end was carried in a hole in that plate of the movement which is nearest the dial, and on the very extremity of this end was a pinion, usually of the lantern kind, gearing with a wheel whose pipe projected through the centre of the dial and carried the hand. Pinions having five leaves were, so far as my observation goes, almost invariably used for the train, and for the wheel teeth the following numbers: great wheel, 55; second, 45; contrate, 40; escape

wheel, 15. A projection from the verge "banked" against the potence to prevent overrunning. There being a wheel and pinion less in the train than is usual now, the escape-wheel ran the reverse way; its teeth and the verge therefore appear to be left-handed to the modern watchmaker.

John Fitter, about 1665, made a watch with the extra wheel and pinion, the contrate wheel of which turned once in a minute, but there is no doubt the longer train was not generally viewed with favour till the balance-spring was introduced in 1675; very soon after that date it became universal, together with wheel work arranged for a run of thirty hours.

Among earlier and exceptional departures from the three wheel train may be mentioned an unnamed watch in the Guildhall Museum which has four low numbered wheels. The hand work



FIG. 357.—English Watch without screws, about 1600 (A S).



FIG. 358.—English Watch, about 1650 (A S).

consists of a three-leaved lantern on the great wheel arbor, driving a wheel of twenty-seven attached to the hand; the fusee being cut for twelve turns, the watch would run for fifteen hours only. This specimen dates apparently from about 1650.

Fig. 357 is a view of a very early English watch movement, certainly not later, I think, than 1600. There are no screws used in its construction, and the mainspring is adjusted by means of a ratchet and click. The train is of the numbers already given, the hand is driven by four pegs projecting from the great wheel arbor, acting with a hand wheel of thirty-six teeth. The fusee makes barely eleven turns. Inscribed on the plate is the maker's name, "Simon Bartram." Either he or possibly his namesake and successor was appointed in the Charter of the Clockmakers' Company to be one of the "Assistants," as the members of the Committee of Management were termed.

The first noticeable departure from the primitive arrangement was the adoption of a tangent wheel and screw for the regulation of the mainspring, which was introduced about 1610, and is shown in Fig. 358. On the barrel arbor above the tangent wheel is a disc of silver with divisions figured as a guide in setting the mainspring up or down; this adjustment being evidently used to regulate in some measure the timekeeping of the watch.

An alternative attempt at regulation before the advent of the balance spring is fitted to the movement of a watch shown on page 67, and in another at the Guildhall Museum. On a movable plate are two pins which intercept the arms of the balance at longer or shorter arcs. Fig. 359, taken from an early seventeenth-century watch is reproduced from the catalogue of the Geneva Exhibition of 1896. The watch at the Guildhall is earlier, it is in an octagonal case fitted with the stackfreed, and dates probably from about 1575.

A pendulum watch with a slit in the dial was illustrated on page 148. This proved to be an inconvenient arrangement, but in the early part of the eighteenth century many watches were made with a cap over the balance as in Fig. 360. The arms of the balance were weighted, and a semicircular perforation in the cap allowed one weight to be visible, the motion of the weight as it vibrated resembling that of a pendulum. Pendulum watches having caps decorated with painting on enamel were very popular among Dutch makers. The watch illustrated is inscribed, "Flower, London," and dates from about 1740.

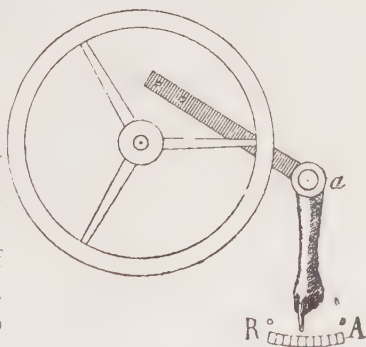


FIG. 359.

As a rule movements of watches were completed without reference to the proximate owner, but an exceptional construction is shown in Fig. 361. The watch dates from about 1700, and is by "Massy, London." Around an heraldic shield bearing the royal arms is the motto, "HONY SOIT QUY MALY PENSE," and below, "SEMPER EADEM." It is of Queen Anne period.

The movement of the watch by Mitzell, of which a front view appears on page 148, is covered by a silver plate, on which the royal arms with supporters are chased, underneath is the motto, "Le Main Tiendra."

The demand for verge watches continued till late in the nineteenth century, and they were made to my knowledge in Clerken-



FIG. 360 (A S).



FIG. 361 (A S).

well till 1882 ; the manufacture ceased then only because the verge finishers died out. The last specimens had lever cocks, because there was no one left to make the orthodox patterns.

Balance Springs.

The introduction of the balance spring, which marks such an important epoch in the manufacture of watches, is due to the investigations of Dr. Robert Hooke.

Hooke, Huygens, and other investigators experimented with various materials to find the most satisfactory controller.

The engraving (Fig. 362) represents a watch of German origin from the collection of Mr. Evan Roberts. It has a day of the month ring, and is generally of the construction usual soon after the middle of the seventeenth century. But the peculiar feature of the movement lies in the application of a straight hog's bristle to regulate the balance. There is no sign of any other spring having been attached, and the accessories of the bristle are quite in character with the rest of the work. There are two arms which embrace the bristle and practically determine its acting length, and by means of a screw these may be shifted to act over a considerable range.



FIG. 362.—Hog's bristle as a Balance Controller.

Steel springs were, however, found to

be the most suitable. The primitive straight ones would of course allow but a very small vibration of the balance, while the to-and-fro motion between pins where it made contact with the balance involved considerable friction. Of others, curved somewhat to the shape of a pothook, there are still examples, but eventually the more convenient and correct form was found to be a volute which had at first but one or two coils. The coils were increased to four or five as the advantage of a larger spring was understood, but the very long springs with which we are now familiar were not applied till the advent of the lever and other detached escapements which allowed the balance to have a larger arc of vibration.

To lengthen or shorten the acting length of the spring, Tompion appears to have used the circular slide with an index from the first. This arrangement, which remained in favour for a long period, is

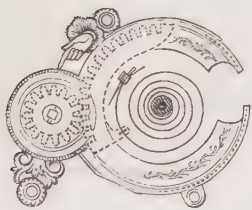


FIG. 363.—Tompion's regulator.



FIG. 363A.—Barrow's regulator (A S).

shown in Fig. 363. Below, and attached to a silver disc, graduated and figured as a guide to regulation, is a pinion which gears with teeth on the outer edge of the circular slide; from the inner edge projects an arm carrying two upright pins which embrace the spring. The projecting end of the pinion is square, so that it could be turned by means of a watch key.

Mr. Schloss has a clock-watch by Nathaniel Barrow, dating from about 1675, in which the outer end of the spring is continued in a straight line to the stud at the edge of the plate, and the regulation accomplished very much in the same way as the hog's bristle watch already delineated. Fig. 363A is a plan of this watch movement. The curved stud on the left is continued in a sort of zig-zag shape to hold one end of the regulating screw. The upper end of the nut points to an index engraved on the plate, and the lower extremity is notched to receive the spring.

The chief drawback to Tompion's regulator is that owing to the backlash or freedom between the teeth of the pinion and slide, a slight reversal of the index has no effect on the curb pins. The simple regulator now generally employed consists of a lever, fitting friction-tight over a boss on the balance cock; the shorter end of the lever carries the curb pins which embrace the balance spring, while the longer end through which it is moved serves also as an indicator of alterations in the position of the curb pins. This device was patented by Bosley in 1755.

There is one point about the stud used in those of Tompion's watches I have seen which might well be revived. The hole in the stud for the reception of the spring was square. The modern system



FIG. 364 (A S).—Watch by Baltazar Martinot, showing early French arrangement of balance spring regulator.



FIG. 364A (A S).

of pinning, by squeezing the flat side of a spring against the surface of a round hole, is altogether unmechanical and must distort the spring.

Fig. 364 represents the top plate of an alarm watch by the celebrated French maker Baltazar Martinot. The balance is very large, planted nearly in the centre of the plate and covered by a handsomely engraved bridge. The pinion and teeth of the slide for regulation of the balance spring are uncovered, and no index appears to have been provided.

A very similar watch by one of the Habrechts of Strasburg has the bridge covered with the picture of a woman smoking a pipe, as shown in Fig. 364A. The painting is finely executed in enamel.

The first of the cocks or brackets used to support
Watch Cocks. one end of the balance staff were probably quite plain, but so prominent a feature of the movement speedily became an object of enrichment. Of the early pierced and

engraved designs examples are given in Figs. 357, 358, 362, 363A, 187. These range from the end of the sixteenth century to 1680, and it will be observed that from its primal office of carrying the balance staff pivot the table of the cock was gradually spread to protect the balance from disturbance. In No. 1 of the subjoined Fig. 365, from a watch by "Jeremie Johnson, Royal Exchange," in the Schloss collection, dating from about 1685, the edge of the table is of a plain circular form and coincident with the outside of the balance rim; the foot is very wide, but its outer edge is carved, and would not correspond with the outline of the plate, to which it would be screwed.

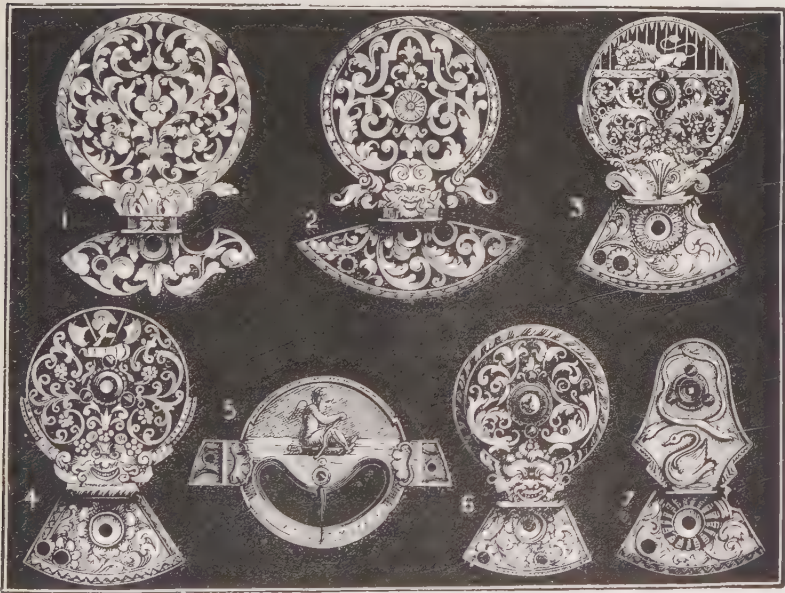


FIG. 365.

No. 2 is from a watch by Thomas Windmills, dating from about 1700. Here the outside of the foot followed the curve of the plate. The narrow neck at the junction of the table and the foot seen in this and in the preceding example appears to have been originally provided as a space for pinning the cock to a stud and to have survived the introduction of screw fastenings. The floral pierced work in No. 1 and No. 2 is very similar, but the basket or pot in the first is in the latter discarded for a cherub's head, and from this period heads or masks seem to have been incorporated with most of the designs so long as the pierced cocks lasted. Curiously enough,

the streamers at the sides of the basket, which look appropriate, are incongruously retained with the head ; still, the streamers and masks were associated for thirty or forty years. About 1720, cocks with solid feet were made, though the pierced variety is met with till about 1770.

No. 3, with a jewelled centre and a representation of a lion in a cage, dates from about 1770, and No. 4, with the heraldic emblems, from 1780.

With few exceptions, French and Dutch manufacturers used a bridge instead of a cock. No. 5, a pretty specimen, is from a pendulum watch made about 1740. Others are shown on pages 150 and 346. On the latter page is included a finely enamelled one.

The beautiful pierced work was unable to withstand the utilitarian spirit of the nineteenth century, though it died hard. No. 6 is from a watch by James Wild, London, with the hall mark for 1788. The solid lever form of cock (No. 7) was taken from a verge watch with the hall mark of 1826. A few years ago a taste for watch cock necklaces, brooches, and bracelets arose, and thousands of interesting movements were destroyed in mad haste to supply material for an evanescent fancy.

Watch Pillars.

Though the pillars which connect the two plates of a watch movement are now universally made of a plain cylindrical form, they have been formerly the subjects of considerable enrichment. In most of the early movements of a small size the pillars were round ; the larger ones were usually square, and often engraved ; but one of the first obvious departures from the utilitarian form in order to please the eye, is shown in No. 1 of the subjoined engraving. This is known as the



FIG. 366.

tulip pillar, and seems to have been introduced in deference to what may be called the tulip-mania, which followed the introduction of tulip bulbs into England and led artists to incorporate the flower with almost every kind of decoration. For about 25 years from 1676 many of the finest watches were made with tulip pillars. In some instances the vertical division shown in the engraving was omitted. The square Egyptian pillar, No. 2, was introduced about 1640, and continued in use for many years, the central slit

being often wider than the example, with a vertical division and decorations on the face; silver was the material favoured for the decorations and divisions. The plainer square pillar, No. 3, has also had a long life, for it is met with in watches nearly two hundred years old, and also in specimens produced in the early part of the present century. No. 4 is taken from a watch by Ellicott, the case of which has the hall-mark for 1746, and the elegant outline is quite in accord with the popular taste at that time. No. 5 is a little later, and is taken from a watch by James Markham, a well-known maker for the Dutch market. During the period devoted to fancy pillars, many watches were made without regard to the popular taste in this particular. A repeater by Graham in my possession is furnished with plain round pillars, with small bodies and collars formed at the top and bottom, to afford a more secure bearing on the plates.

Watch Escapements. The verge, the earliest escapement, was explained on page 30. About 1660 the Abbé Hauteville invented the "Virgule," illustrated in Fig. 367. Its action will be understood by those conversant with escapements.

Tompion devised a form of watch escapement shown on page 177, and subsequently were introduced, among others, the cylinder and duplex. In accordance with my promise to avoid technicalities and modern construction, I do not propose to descant on these; they are dealt with fully in the "Watch and Clock Makers' Handbook." The best of all watch escapements, the lever, which Mudge invented and applied to a watch for Queen Charlotte, was analogous in its action to the present form of double roller escapement, except that the impulse pin was divided, for the purpose of ensuring the safety action after the finger enters the crescent, and before the impulse pin is fairly in the notch, a result now attained very simply by having horns to the lever. Curiously enough, the advantages of Mudge's invention seem to have remained unrecognized for many years, except by a few of his watchmaking friends. George Margetts and Josiah Emery seem to have been impressed with it, and the latter made for Count Bruhl a watch furnished with a lever escapement on Mudge's plan, which performed so satisfactorily that

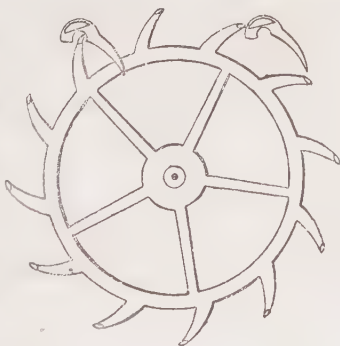


FIG. 367.—Virgule escapement.

Emery was induced to continue its use. In 1793 he told a committee of the House of Commons appointed to inquire into Mudge's claim to the Government reward, that he had made thirty-two or thirty-three such watches, and that his price for them was £150 each.

By favour of Mr. George Burrell, I had the privilege a short time ago of inspecting a very fine watch which Emery made for the Duke of Portland. It had a lever escapement and a second roller for the safety action, practically similar to the arrangement in first-class timekeepers of to-day. The impulse pin was of steel, and pivoted in jewel holes, so that it rolled in and out of the notch. The watch, Mr. Burrell said, was originally hung in gymbals in a wooden box.

In the collection of the Clockmakers' Company at the Guildhall is an interesting watch by John Leroux, of Charing Cross, who was admitted an honorary freeman of the Company in 1781. This watch, by the hall mark in the case, was made in 1785, and the peculiar feature of it is the escapement, which is a lever, but the pallets are of unusual form and act with teeth resembling those of the cylinder escape wheel.

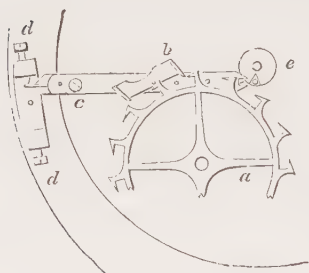


FIG. 368.

a. The Wheel. *b.* The Pallets. *c.* The Lever. *d d.* Banking Screws. *e.* The Detaining Roller, below which on the same axis is another roller or disc with a ruby pin, as usual, for receiving impulse from the lever fork.

Peter Litherland in 1791 patented the rack lever escapement, in which the lever terminates in a segmental rack which gears with a pinion on the balance axis. Although this was an undetached escapement, and therefore wanting in the chief excellence of Mudge's conception, it met with considerable success, a large number being made in the early part of the present century by Roskell of Liverpool, chiefly for the American market.

About 1800, Edward Massey, a Staffordshire watchmaker, invented the crank roller, in which the impulse pin is projected beyond the periphery of the roller, something like the finger in the going barrel stopwork. Contact of the extremities of the lever with the edge of the roller formed the safety action. The final perfecting of the table roller variety is ascribed to George Savage, a Clerkenwell watch finisher, some years afterwards.

Watch Jewelling.

In the early part of the eighteenth century was introduced the practice of using highly polished surfaces of hard stone for the bearings of the smaller quickly moving watch pivots and other rubbing contacts.

In 1704 a patent was granted to Nicholas Facio, Peter Debaufre, and Jacob Debaufre, for the application of jewels to the pivot holes of watches and clocks. Facio, the inventor, was a native of Basle, where he was born in 1664, coming to England in the early part of 1687. Here he seems to have busied himself with scientific pursuits, and towards the end of the century he was elected a Fellow of the Royal Society. His co-patentees were watchmakers, living in Church Street, Soho, and an advertisement in the *London Gazette* of May 11, 1704, announced that jewelled watches were to be seen at their shop, stating also that they made "free watches." A watch bearing the name of "Debauffre" is to be seen at the South Kensington Museum.

Before the patent was many months old, the patentees applied to Parliament for a Bill to extend it; but this was opposed by the Clockmakers' Company, and on evidence produced by them a Committee of the House of Commons recommended that the Bill be rejected.

In reporting the successful result of their opposition, the master of the Clockmakers' Company acquainted the court that in the proofs brought against the Bill, there was an old watch produced, the maker's name Ignatius Huggerford, that had a stone fixed in the cock and balance work, which was of great use to satisfy the committee.

But the best of the story has yet to be told. In recent years Huggerford's watch was taken down by Mr. E. J. Thompson, a member of the court of the company, and he reported that "The movement is not in any sense jewelled, the verge holes being of brass. A piece of coloured glass or soft stone, fastened in a disc of silver and burnished into a sink in the steel cock, gives a fictitious appearance of jewelling."

About 1720 Facio settled at Worcester, where he died at the age of ninety, and was buried at St. Nicholas' Church in that city in 1753.

One of the first references to winding without open-

Evolution of ing the case of a watch is to be found in an advertise-
Winding ment which appeared in the *London Gazette* for
Mechanism January 10-13, 1686, where a watch by R. Bowen,
for Watches. London, is described as having one motion and the
 spring being wound up without a key, and it opening

contrary to all other watches. Then in Overall's "History of the Clockmakers' Company" it is stated that in 1712 John Hutchinson desired to patent a watch which, among other improvements, "has likewise a contrivance to wind up this or any other movement

without an aperture in the case through which anything can pass to foul the movement." The Clockmakers' Company opposed the application, and a committee of the House of Commons examined witnesses, among others George Graham and Charles Goode. Mr. Goode produced a movement made fourteen years before. Mr. Hutchinson confessed Goode's movement was like his, and eventually withdrew his application.

The next in order is Pierre Augustin Caron, a clever watchmaker of Paris, who in 1752 made for Madame de Pompadour a very small watch, which gained for him a prize from the Academy of Sciences. This appears to have been wound either by turning the bezel or with a slide very similar to the winding slide now used for repeaters. He thus described the watch: "It is in a ring, and is only four lignes across and two-thirds of a ligne in height between the plates. To render this ring more commodious, I have contrived, instead of a key, a circle round the dial carrying a little projecting hook. By drawing this hook with the nail two-thirds round the dial, the watch is rewound and it goes for thirty hours." Caron was an accomplished musician as well as a playwright, and is better known under the name of Beaumarchais, as the author of "*Le Barbier de Seville*" and "*Le Mariage de Figaro*."

In 1764 Frederick Kehlhoff, of London, patented a centre seconds and going barrel watch with a stackfreed remontoire. A watch on this plan by him was wound by turning the bow, the arbor of which terminated in a contrate wheel gearing with an intermediate wheel which engaged with a wheel on the barrel arbor; but nothing was said in his Patent respecting the keyless work.

Lepine, who was associated with Voltaire in the establishment of a watch factory at Ferney, in Switzerland, devised a method of winding in which the button at the pendant was turned partly round, and then pushed in several times till the winding was completed. This was the first of a series of what is known as "pumping" keyless actions.

In 1792 Peter Litherland, who patented the rack lever, claimed (patent No. 1889) "winding up watches, etc., by means of an external lever connected by mechanism with the barrel arbor."

Robert Leslie, in 1793, patented (No. 1970) another pumping keyless arrangement. His claim says, "On the square on which the key should go is a ratch; the pendant, being alternately moved in and out, turns this ratch by means of two clicks on either end of a fork fastened to the pendant."

J. A. Berrollas, in 1827 (No. 5586), patented a somewhat similar contrivance, but used a chain coiled round the winding wheel. I wore for some years a duplex watch by Ganthony with this keyless work, and it answered well.

Edward Massey, in 1814 (3854), Francis J. Massey in 1841 (8947), and Edward Massey again in 1841 (9120), patented varieties of pumping keyless work.

Charles Oudin exhibited at Paris, in 1806, an arrangement shown in Fig. 369: *k* is the barrel, *j* and *g* intermediate wheels gearing with the contrate pinion *h*; *a* is a disc at one extremity of a rod *n b*. The rod is supported by the cock *d*, and has two grooves, into one of which the spring *f* presses, according to the position of the rod. One of these grooves is seen at *c*, the other is hidden, owing to the position in which the parts are shown. When out of use the disc *a* forms part of the ball of the pendant. In order to wind, the rod *n b* is pulled up until the nib at the end of *b* comes in contact with the interior of the pinion *h*, where there is a catch; the spring *f* then falls into the groove *c*, and then the winding is accomplished by turning the ball at *a*. There was no provision for setting hands.

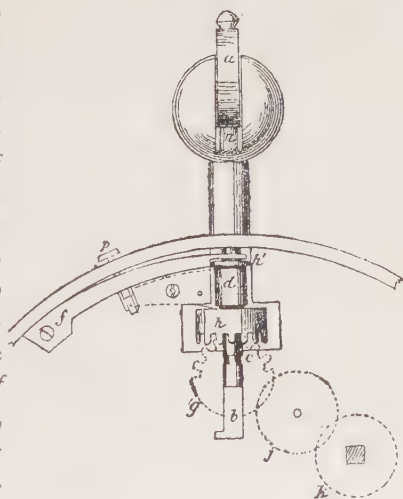


FIG. 369.

Thomas Prest, foreman to J. R. Arnold at his Chigwell chronometer factory, patented in 1820 (No. 4501), a very similar arrangement to the foregoing as far as the winding is concerned, but no provision was made for disconnecting the wheels from the pendant knob.

A. L. Breguet applied winding work to many of his watches, and an arrangement to connect with the motion work for setting hands by pulling out the bow.

Isaac Brown in 1829 (5851), patented a winding-rack attached to the bezel, the bezel being moved round to wind.

Adrien Phillipe, in 1843, invented the shifting sleeve keyless mechanism used in many foreign watches. Lecoultre and

Audemars subsequently made alterations: the present construction of shifting sleeve mechanism is, however, similar in principle to the device of Phillipe.

Adolphe Nicole, in 1844, patented (10,355) a fusee keyless work in which a knob or the pendant was pushed in to make connection with the fusee wheel, and pulled out to connect with the minute wheel.

The rocking bar mechanism for winding and setting hands was patented in 1855 (2144), by Gustavus Hughenin.

Hand-setting arrangement patented by D. L. A. Nicole, in 1855 (2438).

Pierre Noyer, in 1856 (1934), patented fusee winding mechanism with a friction spring to the winding wheel.

In 1856 (2068) William S. Mitchell and Charles M. Gartner combined to patent the application of the rocking-bar to fusee watches, the pinions on the rocking-bar being kept from gearing with either the fusee or the minute wheels by springs. This is a sound action for fusee keyless work, but necessitates the use of two push pieces, one of which must be held in while winding, and the other when setting hands.

Many other devices for fusee winding have been patented, but in view of the decreasing demand for fusee keyless watches, the matter need not be pursued further.

Several methods have been devised for automatic winding, of which two examples are given.

Self-Winding Watches.

Fig. 370 shows an arrangement by Lebet for winding a watch by the action of closing the hunting cover. There is a short gold arm projecting beyond the joint. This arm is connected by means of a double link to a lever, one end of which is pivoted to the plate. To the free end of this lever is jointed a scythe-shaped rack, which works into a wheel with ratchet-shaped teeth on the barrel arbor. A weak spring fastened to the lever serves to keep the rack in contact with the wheel teeth. Instead of the ordinary fly spring, there is a spring fixed to the plate and attached by means of a short chain to the lever. As this spring pulls the cover open, the teeth of the rack slip over the teeth of the wheel on the barrel arbor. Each time the wearer closes the cover, the watch is partly wound. By closing the case eight or nine times, the winding is completed. The ordinary method of hooking in the mainspring would be clearly unsuitable with this winding work, because after the watch was fully wound the case could not be

closed. Inside the barrel is a piece of mainspring a little more than a complete coil with the ends overlapping, and to this piece the mainspring hook is riveted. The adhesion of the loose turn of mainspring against the side of the barrel is sufficient to drive the watch, but when the hunting cover is closed after the watch is wound, the extra strain causes the mainspring to slip round in the barrel.

The method of winding just described can be applied only to a hunting watch. Fig. 371 represents a watch by Breguet with what is known as a pedometer winding. Louis Recordon, in 1780, patented it (No. 1249), and it has been several times re-invented.

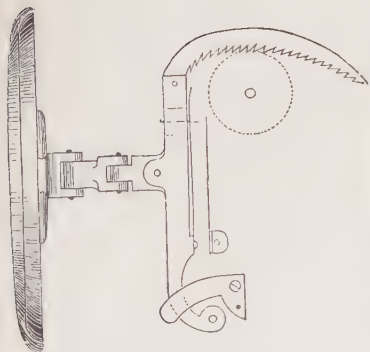


FIG. 370.

Self-winding watch mechanism to act on the closing of the hunting cover.



FIG. 371.—Self-winding or “Pedometer” watch by Breguet (A S).

The motion of the wearer's body is utilized for winding. There is a weighted lever, pivoted at one end, and kept in its normal position against the upper of two banking pins by a long curved spring so weak that the ordinary motion of the wearer's body causes the lever to continually oscillate between the banking pins. Pivoted to the same centre as the weighted lever is a ratchet wheel with very fine teeth, and fixed to the lever is a pawl, which engages with the ratchet wheel. This pawl is made elastic, so as to yield to undue strain caused by the endeavour of the lever to vibrate after the watch is wound.

**Repeating
Watches.**

While the striking mechanism of clock-watches such as were produced by many of the early makers was founded on that used in De Vick clocks, Barlow's and Quare's repeating watches were similar in principle to the rack striking work for house clocks invented by the former. The number of hours or quarters struck depends on the position of the snails which revolve with the timekeeping mechanism. The hammers were actuated by a separate mainspring, which was wound every time it was desired that the watch should repeat. This was done by pushing the pendant in. Connected to the inner end of a pendant was a chain coiled round a pulley attached to the mainspring barrel, and also a lever, which, by coming in contact with the snail, stopped the pendant; so that the mainspring was wound much or little according to the number of blows to be struck.

The chain was found to be the most unsatisfactory part of the mechanism, and at the beginning of the eighteenth century Matthew Stogden substituted a rack for it. Other alterations have since been made in the arrangements, one of the chief being the winding of the mainspring by means of a slide projecting from the band of the case. Barlow and Quare used a bell shaped to the inside of the case, such as had been used before their time for clock-watches; wire gongs, introduced by Julien Le Roy, are now used instead.

Graham introduced a "pulse piece," which upon being pressed kept the hammers off the bell, but allowed the time to be ascertained by counting the throbs or beats on the pulse piece.

Dumb repeaters, said to have been invented by Julien Le Roy, had neither bells nor gongs, the blows being struck on a solid block fixed in the band of the case.

In 1804 John Moseley Elliott patented (No. 2759) an ingenious device for dispensing with the repeating train, as well as striking the hours and quarters and other subdivisions with one hammer. By turning a rod running through the pendant to the right, a pallet on the inner end of it moved round a lever till it came in contact with the hour snail, and while this was being done, each of the teeth, of a ratchet wheel also mounted on the inner part of the pendant rod, engaged with the hammer stalk and caused it to strike on the bell. The number of blows struck depended of course on the position of the hour snail. By turning the pendant to the left, another lever was carried to the quarter snail, and the proposed number of quarters struck in like manner.

The time might in this arrangement be ascertained without a

bell, by first turning the pendant rod as far as the snail allowed, and then reversing it and counting the number of clicks or obstructions caused by engagement with the ratchet. The elder Grant made some dumb repeaters on this plan.

HALL MARKS.

These marks are impressed on watch cases, jewellery, and plate after the quality of the metal has been ascertained by assay at certain official Assay Halls. The marking of jewellery is with few exceptions optional. The hall marking of all watch cases of gold or silver made in Great Britain and Ireland is compulsory. The cost is only the actual outlay incurred in assaying and stamping. The hall mark consists of several impressions in separate shields: there are the standard or quality mark; the mark of the particular office at which the article was assayed; some character by which the date of marking may be traced, and, if duty is chargeable, the head of the reigning sovereign.

The oldest and most important of the Assay Halls is that presided over by the Goldsmiths' Company of London, which is situated in Foster Lane, just at the back of the old General Post Office, St. Martin's-le-Grand. The privilege of assaying and marking precious metals was conferred on the company by statute in 1300. The company received a charter of incorporation in 1327, and their powers have been confirmed subsequently by several Acts of Parliament.

Many early watch cases, especially silver ones of London make, are met with which have no hall mark, the powers of the company not being so strictly enforced then as now, or the value of the official assay not being so generally recognized.

Among other records of prosecutions for evading the Hall Marking Acts is one in 1778, when two watchmakers, John G—— and William V——, allowed judgment to go by default in respect of two unmarked silver cases found at the Custom House in a cask of hardware.

Repoussé cases, with other artistic wares of a similar character, are specially exempted from assay.

It was not till 1798 that a lower standard of gold than 22 carat was allowed, 18 carat was then recognized; in 1854 three further standards, 15, 12 and 9 carat, were introduced.

The standard mark of the London Hall is a lion passant for sterling silver. A lion passant was also the standard mark on 22-carat gold up to 1845.



For gold of 22 carats the standard mark is now a crown, and the figures 22. For 18-carat gold the standard mark is a crown and the figures 18.



For 15-carat gold	15	and	0.625	} Pure gold being 24 carats, these decimals * represent the proportions of pure gold in the article so marked.
„ 12 „	12	„	0.5	
„ 9 „	9	„	0.375	

The London Hall Mark prior to 1823 was a crowned Leopard's head ; from January 1st, 1823, it was uncrowned ; specimens of both styles are appended.



Date marks of the London Hall, given on pages 286, 287, are, with one or two exceptions, actual reproductions which I have made from watch cases. Specimens of the earliest marks are not to be obtained.

There was a duty on silver articles of sixpence an ounce from 1719 till 1758, but no special duty mark ; in 1784 a similar duty was imposed, and then the head of the reigning sovereign was impressed to denote the payment of duty. The Act came into operation on December 1st, 1784, and at first the head had a curious appearance, being incised, or incuse as it is called, instead of in relief as the other marks were. Cases with the London mark and the letter K, which corresponds to the period from May, 1785, to May, 1786, have the duty head incuse, after which the head appears in relief with London marks. I have a pair of cases with the head incuse, and the Birmingham mark with the letter N, which would denote the period from July, 1786, to July, 1787. In 1804 the duty on silver was increased to 1s. 3d., and on gold to 16s. an ounce. In 1815 a further increase to 1s. 6d. and 17s. 6d. respectively was made, and the duty continued at these amounts till 1890, when it was finally abolished. Watch cases were exempted from duty in 1798.

The maker's mark before 1697 was some emblem selected by him ; in that year it was ordered to be the two first letters of his surname ; since 1739 it has been the initials of the maker's Christian and surnames.

On March 25th, 1697, the quality of standard silver was raised from 11 ozs. 2 dwt. to 11 ozs. 10 dwt. of pure silver in 12 ozs. of plate ; a lion's head erased was then used as the standard mark, and a figure of Britannia as the hall mark ; but on June 1st, 1720, the

old standard of 11 ozs. 2 dwts., and the old marks of a lion passant and a leopard's head were reverted to, although the higher standard with the figure of Britannia is still occasionally used.

MARKS OF OTHER ASSAY OFFICES.

Chester.—Hall mark, a sword between three wheatsheaves. Prior to 1779 it was three demi-lions and a wheatsheaf on a shield. Standard mark for 18-carat gold, a crown and the figures 18. For silver, a lion passant. Before 1839 a leopard's head in addition. Chester date marks are given on page 362.

Birmingham.—Hall mark, an anchor in a square frame for gold, and an anchor in a pointed shield for silver. Standard mark for 18-



carat gold, a crown and the figures 18; for silver, a lion passant. Birmingham date marks are given on page 362.

Sheffield.—A crown (silver is only assayed).

Exeter.—A castle with three towers.

York.—Five lions on a cross.

Newcastle.—Three castles.

Norwich.—A castle and lion passant. (The Norwich Assay office is now closed.)

Edinburgh has a thistle for the standard mark, and a castle for the hall mark.

Glasgow has a lion rampant for the standard, and a tree, a fish, and a bell for the hall mark.

Dublin has a harp crowned as the standard mark for sterling silver and for 22-carat gold, with the figures 22 added in the latter case; for 20-carat gold, a plume of three feathers and 20; for 18-carat gold, a unicorn head and 18. The lower qualities of 15, 12, and 9, are marked with the same standard mark as is used at the London Hall. The hall mark for Dublin is a figure of Hibernia.



DATE MARK ON GOLD AND SILVER PLATE AND WAT

The shields represented in the subjoined tables are those used
shield is invariably in the shape of a rectangle, with

NOTE.—The Date Mark is altered on the 30th of May
the 30th of May

 1678	 *	 1716	 1736	 1756	 1776
 1679	 1697	 1717	 1737	 1757	 1777
 1680	 1698	 1718	 1738	 1758	 1778
 1681	 1699	 1719	 1739	 1759	 1779
 1682	 1700	 1720	 1740	 1760	 1780
 1683	 1701	 1721	 1741	 1761	 1781
 1684	 1702	 1722	 1742	 1762	 1782
 1685	 1703	 1723	 1743	 1763	 1783
 1686	 1704	 1724	 1744	 1764	 1784
 1687	 1705	 1725	 1745	 1765	 1785
 1688	 1706	 1726	 1746	 1766	 1786
 1689	 1707	 1727	 1747	 1767	 1787
 1690	 1708	 1728	 1748	 1768	 1788
 1691	 1709	 1729	 1749	 1769	 1789
 1692	 1710	 1730	 1750	 1770	 1790
 1693	 1711	 1731	 1751	 1771	 1791
 1694	 1712	 1732	 1752	 1772	 1792
 1695	 1713	 1733	 1753	 1773	 1793
 1696	 1714	 1734	 1754	 1774	 1794
	 1715	 1735	 1755	 1775	 1795

* This letter appears to have been used only from March to May, 16
Britannia and a lion's head erased was used instead of
† Watch cases marked between December, 1784, and May, 1798, wo

MARKED AT GOLDSMITHS' HALL, LONDON.

and for 22-carat gold. For lower qualities of gold the
rs taken off like the one surrounding the A in 1876.

year, lasting from the date indicated in the Table till
following year.

A 1796	a 1816	A 1836	a 1856	A 1876	a 1896
B 1797	b 1817	B 1837	b 1857	B 1877	b 1897
C 1798	c 1818	C 1838	c 1858	C 1878	c 1898
D 1799	d 1819	D 1839	d 1859	D 1879	d 1899
E 1800	e 1820	E 1840	e 1860	E 1880	e 1900
F 1801	f 1821	F 1841	f 1861	F 1881	f 1901
G 1802	g 1822	G 1842	g 1862	G 1882	g 1902
H 1803	h 1823	H 1843	h 1863	H 1883	h 1903
I 1804	i 1824	I 1844	i 1864	I 1884	i 1904
K 1805	k 1825	K 1845	k 1865	K 1885	k 1905
L 1806	l 1826	L 1846	l 1866	L 1886	l 1906
M 1807	m 1827	M 1847	m 1867	M 1887	m 1907
N 1808	n 1828	N 1848	n 1868	N 1888	n 1908
O 1809	o 1829	O 1849	o 1869	O 1889	o 1909
P 1810	p 1830	P 1850	p 1870	P 1890	p 1910
Q 1811	q 1831	Q 1851	q 1871	Q 1891	q 1911
R 1812	r 1832	R 1852	r 1872	R 1892	r 1912
S 1813	s 1833	S 1853	s 1873	S 1893	1913
T 1814	t 1834	T 1854	t 1874	T 1894	1914
U 1815	u 1835	U 1855	u 1875	U 1895	1915

the 25th March, 1697, to the 1st June, 1720, the figure of
d leopard's head and a lion passant, see page 358.
extra stamp representing the head of George III.; see page 358.

BIRMINGHAM ASSAY OFFICE DATE LETTERS.

NOTE.—The Date Mark is altered on the 1st July of each year, lasting from the Date indicated in the Table till the June following.

A ... 1773	a ... 1799	A ... 1825	A ... 1850	a ... 1875
B ... 1774	b ... 1800	B ... 1826	B ... 1851	b ... 1876
C ... 1775	c ... 1801	C ... 1827	C ... 1852	c ... 1877
D ... 1776	d ... 1802	D ... 1828	D ... 1853	d ... 1878
E ... 1777	e ... 1803	E ... 1829	E ... 1854	e ... 1879
F ... 1778	f ... 1804	F ... 1830	F ... 1855	f ... 1880
G ... 1779	g ... 1805	G ... 1831	G ... 1856	g ... 1881
H ... 1780	h ... 1806	H ... 1832	H ... 1857	h ... 1882
I ... 1781	i ... 1807	I ... 1833	I ... 1858	i ... 1883
J ... 1782	j ... 1808	J ... 1834	J ... 1859	j ... 1884
K ... 1783	k ... 1809	K ... 1835	K ... 1860	k ... 1885
L ... 1784	l ... 1810	L ... 1836	L ... 1861	l ... 1886
M ... 1785	m ... 1811	M ... 1837	M ... 1862	m ... 1887
N ... 1786	n ... 1812	N ... 1838	N ... 1863	n ... 1888
O ... 1787	o ... 1813	O ... 1839	O ... 1864	o ... 1889
P ... 1788	p ... 1814	P ... 1840	P ... 1865	p ... 1890
Q ... 1789	q ... 1815	Q ... 1841	Q ... 1866	q ... 1891
R ... 1790	r ... 1816	R ... 1842	R ... 1867	r ... 1892
S ... 1791	s ... 1817	S ... 1843	S ... 1868	s ... 1893
T ... 1792	t ... 1818	T ... 1844	T ... 1869	t ... 1894
U ... 1793	u ... 1819	U ... 1845	U ... 1870	u ... 1895
V ... 1794	v ... 1820	V ... 1846	V ... 1871	v ... 1896
W ... 1795	w ... 1821	W ... 1847	W ... 1872	w ... 1897
X ... 1796	x ... 1822	X ... 1848	X ... 1873	x ... 1898
Y ... 1797	y ... 1823	Y ... 1849	Y ... 1874	y ... 1899
Z ... 1798	z ... 1824			

CHESTER ASSAY OFFICE DATE LETTERS.

The Date Mark is altered on the 1st July, lasting from the Date indicated in the Table till the end of June in the following year.

A 1701	A 1726	A 1752	a 1776	A 1797	A 1818	A 1839	a 1864
B 1702	B 1727	B 1753	b 1777	B 1798	B 1819	B 1840	b 1865
C 1703	C 1728	C 1754	c 1778	C 1799	C 1820	C 1841	c 1866
D 1704	D 1729	D 1755	d 1779	D 1800	D 1821	D 1842	d 1867
E 1705	E 1730	E 1756	e 1780	E 1801	E 1822	E 1843	e 1868
F 1706	F 1731	F 1757	f 1781	F 1802	F 1823	F 1844	f 1869
G 1707	G 1732	G 1758	g 1782	G 1803	G 1824	G 1845	g 1870
H 1708	H 1733	H 1759	h 1783	H 1804	H 1825	H 1846	h 1871
I 1709	I 1734	I 1760	i 1784	I 1805	I 1826	I 1847	i 1872
K 1710	K 1735	J 1761	k 1785	J 1806	K 1827	K 1848	k 1873
L 1711	L 1736	K 1762	l 1786	L 1807	L 1828	L 1849	l 1874
M 1712	M 1737	L 1763	m 1787	M 1808	M 1829	M 1850	m 1875
N 1713	N 1738	M 1764	n 1788	N 1809	N 1830	N 1851	n 1876
O 1714	O 1739	N 1765	o 1789	O 1810	O 1831	O 1852	o 1877
P 1715	P 1740	O 1766	p 1790	P 1811	P 1832	P 1853	p 1878
Q 1716	Q 1741	P 1767	q 1791	Q 1812	Q 1833	Q 1854	q 1879
R 1717	R 1742	Q 1768	r 1792	R 1813	R 1834	R 1855	r 1880
S 1718	S 1743	R 1769	s 1793	S 1814	S 1835	S 1856	s 1881
T 1719	T 1744	S 1770	t 1794	T 1815	T 1836	T 1857	t 1882
U 1720	U 1745	T 1771	u 1795	U 1816	U 1837	U 1858	u 1883
V 1721	V 1746	U 1772	v 1796	V 1817	V 1838	V 1859	
W 1722	W 1747	V 1773				W 1860	
X 1723	X 1748	W 1774				X 1861	
Y 1724	Y 1749	X 1775				Y 1862	
Z 1725	Z 1750					Z 1863	
	Z 1751						

LIST OF FORMER CLOCK AND WATCHMAKERS

THE dates following the names in this alphabetical list signify the period when the person referred to was connected with the Clockmakers' Company, or known to be in business, or when some example of his work was made. It does not necessarily follow that he then either began or relinquished the trade. Throughout the list C.C. stands for Clockmakers' Company, B.M. for British Museum, S.K.M. for South Kensington Museum, and h.m. for Hall Mark. Following the names or addresses of some of the makers is a slight description of specimens of their work which have been met with, or of some invention or distinguishing trait. Of the more important men, fuller descriptions are given in the body of the book, and reference is then made to the page where such particulars may be found.

On estimating the age of a timekeeper by a maker the only reference to whom is that he was admitted to the Clockmakers' Company, it may in the majority of cases be assumed that he was at the time of his admission a young man just out of his apprenticeship; but there are many exceptions. The first members of the Clockmakers' Company were many of them of mature years at the time of the incorporation; and afterwards men who had made some mark or whom circumstances had brought into notice were then induced to join. Hon. freemen, elected after 1781, had all made their reputation before entry.

It is easy to understand that the roll of membership of the company at no time represented the whole of the clockmakers and watchmakers within its sphere of action. Many who did not care to join would escape observation, and then those who were free of other guilds at the incorporation made their apprentices free of the particular company to which they were attached.

Although the addresses of the freemen at first are rarely given, it may be taken for granted that they were nearly all within a radius

of ten miles, and among the later ones it will be found that very few of them resided at any great distance from the metropolis.

Tracing the residence or business location of manufacturers is often more difficult than many would imagine. William Clement is referred to in scores of books as "an eminent London Clockmaker who first applied the Anchor Escapement to clocks," and was doubtless a leading member of his trade. He was master of the Clockmakers' Company and presided when Graham took up the freedom on completion of his indentures, yet his name does not appear in any Directory of the period, and I am quite unable to discover where he resided or practised his craft. To mention another instance of a century later—Earnshaw, after he had enlisted the interest of Dr. Maskelyne, Astronomer Royal, who tried a watch of his at the Greenwich Observatory, was told by the Doctor that he had lost an order for two watches which Arnold made because Maskelyne did not know where he lived !

On some of the early clocks and watches the name inscribed was that of the owner ; but in 1777 an Act of Parliament required the name and place of abode of the maker to be engraved. Still it must not be concluded that in every instance the name engraved on a timekeeper indicates its maker or even that the inscription represents any corporeal existence. In 1682 the C. C. seized from workmen "using the art of clockmaking four unfinished movements two whereof have engraven thereon Ambrose Smith, Stamford and William Burges, fecit, and another Jasper Harmar, all of which names are greatly suspected to be invented or fobbed." The practice of using apocryphal names has continued to the present day. Sometimes it was adopted by manufacturers of repute for watches of a lower quality than those of which they cared to own the paternity. Occasionally in such instances the letters composing the name of the manufacturers would be placed backwards. Many watches marked "Rentnow, London," are to be met with, and they doubtless emanated from the Wontner's, well-known makers of a century ago. The mark "Yeriaf" on a watch in the Guildhall Museum is probably another example of this reversion. Some watches with fictitious names would be the production of workmen who occasionally made a watch for a private customer, and preferred to thus conceal their identity rather than brave the displeasure of their employers. Mr. Evan Roberts has a watch marked "Notyap," London, which was possibly the production of Payton, a case maker who in 1790 carried on business in Addle Street. But in most

instances such pseudonyms appear to be really the trade marks of wholesale dealers, who in ordering watches would supply particulars of the name to be engraved. Many hundreds of watches for the Dutch market were marked "Tarts, London," or "Jno. Tarts, London." Yet I do not think anyone has been able to trace a manufacturer named Tarts. Between 1775 and 1825 the custom of having the name of the owner and not of the maker was often reverted to, usually with A.D. preceding the date figures, and occasionally also "aged 21," or "married," or "born."

The more reprehensible act of adopting celebrated names appears also to have been of early origin. In Overall's "History of the Clockmakers' Company," it is stated that in 1704 the master of the C. C. reported "certain persons at Amsterdam were in the habit of putting the names of Tompion, Windmills, Quare, Cabrier, Lamb, and other well-known London makers on their works, and selling them as English." It is to be feared that some English makers were not free from suspicion of similar misdeeds both then and since.

The locality of the residences may not in all cases be readily recognized. Sweeting's Alley, Cornhill, or Royal Exchange, evidently a favourite spot with the craft, was where the statue of Rowland Hill now stands. It was not rebuilt after the destruction of the Exchange by fire, in 1838. Bethlem, or Bethlehem, was in Moorfields, facing London Wall. In the early part of the eighteenth century the three Moor Fields extended from there over the space now occupied by Finsbury Circus and Finsbury Square to Windmill Hill Row, a continuation of which, called Hog Lane, led into Norton Folgate. The whole of this thoroughfare is now known as Worship Street. Windmill Hill is now Wilson Street. The portion of the City Road by Bunhill Fields was then Royal Row. Love Lane now forms part of Southwark Street, and Maid Lane of Southwark Bridge Road. Rosemary Lane is now Royal Mint Street, Coppice Row is merged into Farringdon Road. Pickaxe Street was so much of Aldersgate as lies between the Barbican and Fann Street. Butcher Row, now pulled down, occupied the wide part of the Strand between the Church of St. Clement Danes and Temple Bar. Brick Lane, St. Luke's, is now Central Street, and Swan Alley is Great Sutton Street. Swallow Street is now incorporated with Regent Street, and Princes Street, Leicester Square, is merged into Wardour Street. Cateaton Street is now Gresham Street. One side of Wilderness Row remains; the row was widened and transformed into the thoroughfare which cut through

St. John's Square, and is called Clerkenwell Road. Union Street, Bishopsgate, or Spitalfields, is now Brushfield Street; the Bishopsgate Street end, with the larger part of Sun Street, was absorbed in building the terminus of the Great Eastern Railway. Wellington Street, St. Luke's, is now Lever Street. King Street, Clerkenwell is now Cyrus Street; and King Street, Holborn, is Southampton Row. Grubb Street is now Milton Street. The Fleet Street end of what was Water Lane in Tompion's time is now Whitefriars Street.

Hicks' Hall is mentioned. This was the title given to the Sessions House, which at that time stood in the middle of St. John Street, near Smithfield Market. It was afterwards rebuilt on Clerkenwell Green.

Taking into consideration the difficulty of obtaining precise information respecting the early names, added to the vagaries of seventeenth-century orthography, I hope and believe the list is as nearly as possible correct, and tolerably complete, so far as London makers are concerned. Outside of the metropolis I have not attempted to do more than record the facts which happen to be within my reach, and I venture to beg the favour of communications respecting corrections and additions.

For particulars of several Edinburgh makers I am indebted to Mr. John Smith's papers in the *Weekly Scotsman*. It will be noticed that in the seventeenth-century records of the Edinburgh "Incorporation of Hammermen, the word 'Knock' is used to designate a clock, and clockmakers are termed 'Knockmakers.'"

After 1842 the names are given only of those above mediocrity, or concerning whom some peculiarity is known, *and who have ceased to carry on business*. Many of those who are traced to 1842 probably continued for years afterwards, but the list is not intended as a guide to clock and watchmakers of to-day.

Aaron, Benjamin, 17, Bury St., St. Mary Axe, 1840-42. [1807.

Abbis, J., 37, Bishopsgate St. Within,

Abbott, Philip, admitted C.C. 1703.

— **Peter**, admitted C.C. 1719.

— **John**, admitted C.C. 1788; charged with making an agreement to go to St. Petersburg to work at clockmaking, and convicted at Hicks' Hall of the offence. Known as a maker of long-case clocks, 1787-1800.

— **Thos.**, 41, Allen St., 1820-22.

— **Francis**, 50, Market St., Manchester; wrote a book on the management of public clocks (not dated), about 1828.

Abdy, William, 5, Oat Lane, Noble St., 1768-1817.

— **Jno.**, London; watch, 1784.

Abeling, William, 7, Wynyatt St., Clerkenwell, 1817; 36, Spencer St., 1835-42.

Abraham, John, 27, Steward St., Bishopsgate, 1820-23.

Abrahams, H., 21, Bevis Marks, 1800-20.

— **Godfrey**, 51, Prescott St., Goodman's Fields, 1835-42.

— **Samuel**, 23, Little Alie St., 1840-42.

— **A.**, 9, Gt. Prescott St., 1840-42.

— **Elijah**, 27, Hanway St., Oxford St., 1840-47.

Absolon, -, London; long-case clock, strike-silent, sunk seconds, scroll and foliage corners, about 1770.

Achard, George, et fils, Geneva; watch, about 1780.

- Ackers, William**, St. Andrew's, Holborn; pair-case watch in S.K.M., early part of eighteenth century; his bankruptcy noted *Lond. Gaz.* Oct. 28, 1706.
- Acklam, John Philip**, 423, Strand, 1816; 138, Strand, 1840.
— **T.**, 14, Birchin Lane, 1825-33.
- Acton, Thos.**, Clerkenwell, C.C. 1677.
— **Chris.**; bracket clock, about 1725.
— **Abraham**, admitted C.C. 1790.
- Adam, Melchior** (? Melchior Adam), Paris; octagonal crystal-cased watch, Soltzkoff collection, about 1585.
- Adams, John**, 1, Dove Court, Moorfields, 1770-72.
— **C. and J.**, 10, King St., Cheap-side, 1788.
— **Stephen, and Son**, 3, St. Anne's Lane, Aldersgate, 1788.
— **John**, 31, Maiden Lane, Covent Garden, 1790-94.
— **Hy.**, Church St., Hackney; fine long-case clock, about 1800; watch, h.m., 1808; on a paper in the outer case the following:—
"To-morrow! yes, to-morrow! you'll repent
A train of years in vice and folly spent.
To-morrow comes—no penitential sorrow
Appears therein, for still it is to-morrow.
At length to-morrow such a habit gains,
That you'll forget the time that Heaven ordains,
And you'll believe that day too soon will be
When more to-morrows you're denied to see."
— **Francis Bryant**, St. John's Sq., Clerkenwell, master C.C. 1848; 1815-48.
— **F. B. and Son**, 21, St. John's Sq., 1830-42.
- Adamson, Humfry**; maker of a clock for Whitehall Chapel, 1682.
— **John**, admitted C.C. 1686; "A Gold Minute Watch, lately made by Mr. Adamson, over against the Blue Boar in Holborn" (*Lond. Gaz.*, March 3, 1686).
- Addis, William**, 3, Birchin Lane, son of Robert A., of Bristol; apprenticed to George Sims 1738; admitted C.C. 1745, master 1764.
— **George**, 79, Cornhill, 1786-94.
— **George Curson**, 3, Birchin Lane, afterwards 47, Lombard St., livery C.C. 1787; 1780-98.
- Addison, Josh.**, London; watch, 1770.
— **Josh.**, Lancaster, 1817.
- Adeane, Henry**, admitted C.C. 1675.
— **Henry**, admitted C.C. 1705.
- Agar, Jno.**, York; bracket clock, about 1740; Mr. Thos. Boynton has a fine regulator by him, 1756.
— **Jno.**, son of the foregoing, 1765-90.
- Agar, Thos.**, London; watch, 1804.
- Airy, George Biddell**, Astronomer Royal 1853-81; K.C.B. 1874; died 1892, aged 90; devoted much attention to the perfecting of timekeepers.
- Aitken, John**, 55, St. John's St., Clerkenwell; received in 1824 a prize of twenty guineas from the Society of Arts for a clock train remontoire; 1800-26.
- Aitkins, Robt.**, London; watch, 1780.
- Akced, Jno.**, London; watch, 1795.
- Akers, Jas.**, Derby; watch, 1805.
- Alais, M.**, Blois; maker of watches, about 1680.
- Albert, Isaac**, admitted C.C. 1731.
- Albrecht, Michael George**; maker of a gold repeating watch in the S.K.M., bearing the royal arms, outer case *repoussé*, about 1720.
- Alcock, Thomas**; petitioner for incorporation of C.C. 1630 (see p. 157).
- Alder, J.**, London; bracket clock, crown wheel escapement, about 1700.
- Alderhead, Jno.**, 114, Bishopsgate Within, 1780-94; card Ponsonby collection "at the Ring and Pearl, Bishopsgate St., near the Southsea House."
- Alderman, Edwin**, 22, Barbican, 1818-34; livery C.C. 1822.
- Aldred, Leonard**, C.C. 1671.
— **Wm.**, 54, Wood St., 1793; watch-spring maker.
- Aldridge, John**, admitted C.C. 1726.
— **James**, 11, Northumberland St., Strand, 1816-30.
- Aldworth, Samuel**, C.C. 1697.
- Alexander, Robt.**, Edinburgh, 1709.
— **Isaac**, Nottingham; watch, about 1760 (see p. 133).
— **W.**, 10, Parliament St., 1830-40.
— **A., and Co.**, 25, Bedford St., Bedford Sq., 1840.
- Aley, Thomas**, 18, Park Side, Knightsbridge, 1840-42.
- Alkins (Atkins ?)**, London, about 1730.
- Allam, Andrew**, Grubb St., admitted C.C. 1664; maker of lantern clocks, 1664-85.
— **Michael**, London, 1723.
— **Robt.**, London, 1765.
— **William**, Fleet St., 1770-80.
— **and Stacy**, 175, Fleet St., 1783.
- Allan, George**, 9, New Bond St., hon. freeman C.C. 1781; 1760-83; maker of a watch found in a chimney at Newton St., Holborn, in 1895, and said to have belonged to Lord Lovat, who was beheaded in 1747; unfortunately for the legend the hall-mark corresponded to 1768.

- Allan and Clements**, 119, New Bond St., 1785-94.
 — **John**, 119, New Bond St., 1798-1800.
 — **and Caithness**, 119, New Bond St., 1800-4.
 — **Robert**, London; maker of repeating watches, 1780-90.
Allaway, John, admitted C.C. 1695.
Allcock, Jno., 30, St. Martin's Lane; card, B.M. 1787.
 — **William**, watch-hand maker, 36, Allen St., Clerkenwell, 1820.
Allen, Elias, admitted a brother C.C. 1633, master 1636; died 1654.
 — **John**, admitted C.C. 1653.
 — **John**, brother C.C. 1720.
 — **John**, 42, Poultry, 1772-75.
 — **James**, 76, New Gravel Lane; an ingenious watchmaker to whom the Board of Longitude awarded £105 for engine dividing, 1790-1800.
 — **John**, watch-case maker, Barbican; convicted in the Mayor's Court for refusing to become a member of the C.C., although he was at the time free of the Goldsmiths' Company, 1785-89; Aldersgate St. 1794.
 — **George**, Fleet St., liveryman C.C. 1776.
 — **George**, 14, Red Lion Passage, Holborn, 1817-42.
 — **Jno.**, London; watch, 1820.
Allet, George, admitted C.C. 1691.
Alling, Richard, admitted C.C. 1722.
 — **James**, 22, Red Lion St., White-chapel, 1842.
Allison, Thos., London; watch, 1790.
Allkins, Horncastle; watch, 1785.
Allman, W., Prince's St., Storey's Gate, Westminster; card, B.M., 1798.
Allsop, Joshua, Northamptonshire, admitted C.C. 1689.
Allvey, Hy., 5, Old St. Sq., about 1795.
Almond, Ralph, admitted C.C. 1646, master 1678; 1646-79.
 — **John**, admitted C.C. 1671.
 — **William**, Lothbury; maker of a clock for Hall, Bishop of Exeter; C.C. 1633.
Amant; a Paris watchmaker, who invented the Pin Wheel Escapement about 1749.
Ambrose, Edward, apprentice of Elias Voland, 1634.
 — **David**, admitted C.C. 1669.
Ames, Richard, admitted C.C. 1653; died in 1682, after election as master; a clock of his make has dolphin frets and bob pendulum working between going and striking; 1653-82.
 — **William**, admitted C.C. 1682.
- Amyot, Peter**, Norwich; maker of lantern clocks, about 1660.
 — **and Bennett**, Brigg's Lane, Norwich; in 1793 they issued a little book by J. Bennett on the management of a watch.
Amyott, Peter, Norwich; watch, Nelthropp collection, about 1720.
 — **Thos.**, London; watches, h.m., 1751-71; one Nelthropp collection, about 1770.
Anderson, Geo.; sued in 1777 by Cabrier for putting his name on five watches.
 — **Richard**, Lancaster, 1767.
 — **J.**, London; watch, 1775.
 — **R.**, Preston; watch, 1778.
 — **Hugh**, London; watch, 1792.
 — **R.**, London; watch, 1812.
 — **Edward C.**, Newington Butts; a successful watchmaker who carried out the not unreasonable rule of making a charge for furnishing a repairing estimate if it involved taking down a watch; 1835-85.
Anderton, Jno., Little Wild St.; repeating watch, about 1750.
Andrew, J., 14, Queen St., Ratcliff Cross, 1820.
Andrews, John, Leadenhall St., admitted C.C. 1688; 1688-1710.
 — **Richard**, C.C. 1703; watch, 1730.
 — **Thomas**, admitted C.C. 1705.
 — **Robert**, admitted C.C. 1709.
 — **James**, admitted C.C. 1719.
 — **William**, admitted C.C. 1719.
 — **Abraham**, Bank Coffee House, Threadneedle St., 1759.
 — **Rich.**, 124, Leadenhall St., 1775.
 — **Eliza**, 85, Cornhill, 1790-1800.
Angel, Richard; repairer of clock at Wigtoft, Boston, Lincolnshire, 1484.
Anness, William, 102, Cheapside, 1798-1820; livery C.C. 1802.
Annis, Jno., 13, Sparrow Corner, 1810-18.
Ansell and Son, watch-spring maker, 22, Whitecross Place, 1798-1820.
 — **Hy.**, 17, Colchester Sq., Savage Gardens, 1830; 74, Leman St., 1838.
Anthony, —; clockmaker to Henry VIII., 1529.
 — **William**, 55, Red Lion St., St. John's Sq., Clerkenwell. In the Dunn Gardner Collection at S.K.M. is a magnificent long oval watch by him, in a gold case, bearing the hall-mark for 1796. It is rather a large size, back enamelled and decorated with diamonds and pearls; but the peculiar feature is that the dial is also oval; the hands are jointed, and automatically lengthen and

shorten as they travel round; another example is an eight-day watch of similar shape, duplex escapement, movement beautifully engraved, formerly in the Bentinck-Hawkins' collection. He is reputed to have been one of the most expert watchmakers of his day, and such specimens of his work as remain quite bear out this belief. He carried on a most successful business in Red Lion Street, St. John's Square, and most of his watches bore the inscription "Wm. Anthony, St. John's Square." At one time he was in good circumstances, and took an active part in founding the Watch and Clockmakers' Benevolent Institution in 1815, though he lived to be a recipient of its bounty. Apart from his art he did not exhibit particular sagacity. He engaged in litigation with Grimaldi & Johnson, which ended disastrously, and expended a large amount in the purchase of royal and other wardrobes of the time of Charles I. Of these he formed an exhibition at the Somerset Gallery, next door to Somerset House, and now 151, Strand. This also turned out a complete and most expensive failure. He had a considerable sum invested in good leasehold property on the Doughty Estate. He died in Jerusalem Passage in 1844, and was then about eighty years of age. After his death the leases of his property were found in his safe. Curiously enough, the term for which he held had just about expired, but he had not troubled to collect any rents for at least twenty years previously, and it was concluded he had forgotten all about his possessions. Mr. Bailey, of the Strand, has a miniature taken when he was about fifty-five years of age.

Antis, Jno., Fulneck, near Leeds; received in 1805 £21 from the Society of Arts for a clock escapement.

Antram, Joshua, London; long walnut-case clock, square dial, cherub corners, circles round winding holes, about 1700; watch, about 1710.

Antt, G., 158, Strand, 1769-88.

Apelyne, Francis (French), admitted C.C. 1687.

Appleby, Edward, admitted C.C. 1677; watch, about 1700.

— **Joshua**, apprentice of Daniel Quare, admitted C.C. 1719, master 1745; 1719-46.

Appleby, P., London; watch, 1825.

Applegarth, Thomas, C.C. 1674.

Appleton, Henry, 50, Myddelton Sq., 1840-42; afterwards in partnership with Birchall, in Southampton Row.

Appleyard, R., London; watch, about 1790.

Archambo, Jno., Prince's St., Leicester Fields; maker of a fine marqueterie case clock, arch dial; also of a *re-poussé* case verge watch, hall-mark 1730, and another watch of a later date; 1720-45.

Archer, Henry, admitted C.C. 1630; subscribed £10 for incorporation of C.C., and was the first warden, 1630-49.

— **John**, admitted C.C. 1660.

— **Edward**, admitted C.C. 1711.

— **Samuel**, 15, Leather Lane, 1794; 33, Kirby St., Hatton Garden, 1810; a prominent man in the trade. In 1820 he was treasurer to the Watch and Clockmakers' Benevolent Institution.

— **Sam. Wm.**, Hackney, 1805-12.

— **Thomas**, 6, Long Lane, Smithfield, 1814-20.

Argand, l'ainé, Geneva, about 1740.

Ariel, James, watch-movement maker, 10, Wilderness Row, 1815-20.

— **John**, 10, Percival St., 1822-39.

Aris, Jno., and Co., Old Jewry, 1794.

Arlandi, John, chain-maker for watches, Red Rose St., Covent Garden, 1680.

Arlaud, Benjamin; maker of a large silver repeating-watch in the B.M., about 1680; another specimen of rather earlier date, with minute hand, but no balance spring, inscribed "Arlaud, London."

Armitage and Co., 88, Bishopsgate Within, 1798.

Armstrong, John, C.C. 1724.

Arnold, Thomas, admitted C.C. 1703.

— **Hy.**, 46, Lombard St., 1769-88.

— **Edward**, London; watch, 1790.

— **John**, Devereux Court, Fleet St., 1760; 112, Cornhill, 1780 (see p. 229).

— **and Son**, 112, Cornhill, 1798.

— **John Roger**, Bank Buildings, 102, Cornhill, 1804; 26, Cecil St., 1816-30.

— **John R., and Dent**, 84, Strand, 1830-40.

— **John R.**, 84, Strand, 1842.

Arnott, Richard, 18, Red Cross St., Barbican, 1810-25.

Arthanel, Aron Louis; table clock, about 1640.

Arthaud, Louis, à Lyon; silver alarum watch, nicely pierced case, Schloss collection, about 1650; p. 131.

- Arthur, William**, C.C. 1676.
Ascough, see Ayscough.
Ash, —, subscribed £2 for incorporation of C.C. 1630.
 — **Ralph**, admitted C.C. 1648.
Ashbourne, Leonard, at the Sugar Loaf in Paternoster Row, next Cheapside; inventor and maker of a clock lamp, 1731.
Ashley, Chas., London; watch, 1767.
 — **J. P.**, 99, Baches Row, City Rd., 1800.
 — **and Mansell**, 34, Rosoman St., Clerkenwell, 1825-35.
 — **Edward**, 9, John St., Pentonville, 1842.
Ashurst, William, C.C. 1699.
Ashwell, Nicholas, C.C. 1649.
Aske, Henry, admitted C.C. 1676; George Graham was apprenticed to him in 1688; 1676-96.
Askell, Elizabeth, apprenticed in 1734 to Elinor Moseley; 1734.
Aspinwall, Thomas; maker of small oval watch (see p. 114), about 1605.
 — **Samuel**; maker of a clock watch in possession of Lord Torphichen, about 1655; clock watch, similar period, Evan Roberts' collection.
 — **Josiah**, brother C.C. 1675.
Asselin, London; bracket clock, case covered with tortoise-shell on a red ground, about 1690; another somewhat similar clock, inscribed Stephen Asselin. Mr. W. T. Harkness has a 28-day long-case clock by Asselin, London, about 1700.
Atchison, Robert, apprenticed to Robert Harding 1753; admitted C.C. 1760; 1760-1819.
Atherton, T., London; watch, 1780.
 — **and Hewett (Tools)**, 49, Red Lion St., Clerkenwell, 1789-94.
Atkins, Samuel, Palgrave Court, Temple Bar, 1753-56.
 — **Samuel, and Son**, Palgrave Court, Temple Bar, 1759-63.
 — **Robert**, Palgrave Court, Temple Bar, 1769.
 — **Danl.**, London; watch, h.m., 1776.
 — **Francis**, 35, Clement's Lane; born 1730; apprenticed to Joshua Hassell 1746; admitted C.C. 1759, master 1780, clerk 1785; died 1809.
 — **George**, son of Francis, born 1767, 35, Clement's Lane; warden C.C. 1809, afterwards clerk; died 1855.
 — **George, and Son**, 6, Cowper's Court, Cornhill, 1840-42.
 — **Samuel Elliott**, son of George, whom he succeeded in business and as clerk of C.C., which office he resigned in 1878; chosen master in 1882; born 1807, died 1898.
Atkins, Robert, 20, Salisbury St., Strand, 1770-88.
 — **S.**, watch-case maker, 14, Bridge-water Sq., 1810.
 — **W.**, watch-case maker, 7, Upper Ashby St., Clerkenwell, 1820.
 — **William**, 71, High St., Poplar, 1835-42.
 — **W.**, 3, High St., Hoxton, 1835.
Atis, Leonard, London; maker of lantern clocks, about 1660.
Atkinson, James, admitted C.C. 1667, assistant 1697.
 — **Lancaster; Thos.**, 1767; **Richard**, 1785; **Wm.**, 1817.
 — **Thos.**, 38, Piccadilly, 1814-17.
Attbury, J., watch-movement maker, 15, York St., St. Luke's, 1835.
Attemstetter, David, Augsburg; a celebrated enameller, 1610.
Attwell, Thos., London; clock, about 1750.
 — **Robt.**, Brown's Lane, Spitalfields, 1810-18.
Attwell, Wm., 11, Pitfield St., 1815-25.
Attwood, Geo., born 1746, died 1807; an eminent mathematician; studied watch work, and reported to Parliament on Mudge's timekeeper, 1793.
Atwood, George, 17, Leonard St., Shoreditch, 1820.
 — **Richard**, 41, Poultry, 1800-10.
Auber, Daniel, Whitefriars, 1750.
Aubert and Klastenberger, 157, Regent St., 1835-42.
Augier, Jehan, Paris; maker of large watches, about 1650.
Aukland, Wm., London; watch, 1790.
Auld, William, Edinburgh; friend and partner of Thomas Reid, 1790-1818.
Ault, Thomas, 34, Prince's St., Leicester Sq., 1820-25.
Austen, John, Shoreditch, admitted C.C. 1711; maker of a bracket clock with square dial, pull-chime, black bell-top case, 1711-25.
Austin and Co., 176, Oxford St., 1820.
 — **John**, 136, Oxford St., 1830-40.
Aveline, Daniel, died 1770, when warden C.C.; 1760-70.
Avenall, a family well known as clock-makers in Hampshire for over 150 years, 1640-1810.
 — **Ralph**, Farnham; balance escapement clock, about 1640.
Avenell, Thomas, admitted C.C. 1705.
Avery, Amos, Cheapside, 1774.
 — **Philip**, Red Cross Sq., 1790-94.
Ayres, Richard, admitted C.C. 1680.
Aylward, Jno., Guildford; lantern clock, about 1690.

- Aynsworth, J.**, Westminster; maker of lantern clocks, 1645-80.
- Ayres, Thos.**, 160, Fenchurch St., 1800-30.
- **and Bennett**, 160, Fenchurch St., 1815-20.
- Ayscough, Ralph**, St. Paul's Churchyard, 1758; 18, Ludgate St., 1766-75.
- Bachoffner, Andrew**, 112, Shoreditch, 1775.
- Backhouse, Jas.**, Lancaster, 1726.
- Backquett, Davyd**, C.C. 1632.
- Bacon, John**, admitted C.C. 1639.
- **Charles**, admitted C.C. 1719.
- **Jno.**, London; watch, 1810.
- Bacott, Peter**, London, about 1700.
- Baddeley, Phineas**, C.C. 1662.
- Badger, John**, admitted C.C. 1720.
- Badollet, J. J.**, Geneva, 1770.
- **John**, 50, Greek St., 1842.
- Baffert, à Paris**; clock; Jones collection S.K.M., about 1780.
- Baggs, Samuel**, 3, South St., Grosvenor Sq., 1820-35.
- Bagley, Thomas**, admitted C.C. 1664.
- Bagnall, W. H.**, 42, Union St., Bishopsgate, 1835-40.
- Bagnell, Wm.**, watch-spring maker, Greenhill's Rents, Smithfield, 1794.
- **William**, C.C. 1719.
- Bagot, Jno.**, Lancaster, 1823.
- Bagshaw, William**, C.C. 1722.
- **Hy.**, London; watch, 1820.
- Bagwell, Richard**, 3, Queen St., Cheap-side, 1790-94.
- Bailey, Jeffery**, at ye Turn Style in Holburn, admitted C.C. 1648, master 1674; maker of lantern clocks.
- **Jeremiah**, admitted C.C. 1724.
- **Catherine**, watch-case maker, 22, Clerkenwell Green, 1790-94.
- **and Upjohn**, 12, Red Lion St., Clerkenwell, 1798.
- **Chas.**, London, about 1805.
- **Jno.**, London; watch, 1812.
- **W.**, 19, Radcliff Row, Clerkenwell, 1835.
- Baillon, J. Baptiste**, Paris, 1760; enamelled watch, Dunn Gardner collection, S.K.M., inscribed "J. B. Baillon, horlog. du Roy."
- Bain, Alexander**, Edinburgh; inventor of electric clocks, 1838-58.
- Baird, John**, 190, Strand, 1770-83.
- **W. and J.**, 4, Hatton Garden, 1810-30.
- Baker, Richard**, admitted C.C. 1685; maker of an 8-day clock, ebony marqueterie case, square dial, cherub corners, no door to hood; also a similar clock in oak case, fine hands, 1685-1710.
- Baker, Henry**, Maidstone; one hand lantern clock, about 1700. "A silver Minute Pendulum watch with a silver outcase and a coat-of-arms engraven on it (A Lyon Passant with three Cross Croselets, made by Richard Baker, London), lost in Dunghil Fields nigh Whitechapel Church" (*Lond. Gaz.*, March 3-6, 1689).
- "A silver watch with a shagreen case, with G. M. on it, and with Baker on the Dial Plate" (*Lond. Gaz.*, April 15-18, 1685).
- **Richard**, admitted C.C. 1726.
- **Francis**, Poultry, 1738.
- **Pointer**, London; repeating watch h.m., 1772.
- **John**, 5, King St., Covent Garden, hon. freeman, C.C. 1781; 1770-84.
- **Hy.**, hon. freeman, C.C. 1781.
- **Thos.**, Upper Stamford St., 1833.
- **W.**, 35, Long Acre, 1835-42.
- **Edward**, 11, Angel Terrace, Pentonville, 1840-42.
- Baldwin, T.**, 69, Curtain Rd., 1830-35.
- **Thomas**, 50, Brudenell Placc, New North Road, 1840-42.
- Baldwyn, Thomas**, C.C. 1706.
- Bale, Thomas**, admitted C.C. 1724.
- **Robert Brittel**, Poultry; sold dials bearing his name, 1813.
- Balestree, J.**, 2, Queen St., Soho, 1811.
- Baley, Thos.**, C.C. 1786.
- Balfour, Gilbert**, London; watch, 1760.
- Ball, Edwd.**, 32, Ironmonger Row, 1794.
- Ball and Macaire**, watch-case makers, 32, Northampton Sq., 1820; 26, Myddelton St., 1835.
- Ballantyne, Wm.**, 6, Cable St., 1815 20; 2, White Lion St., Goodman's Fields, 1835; 1820-42.
- Balliston, Thos.**, 5, Banner St., 1842.
- Baltazar, Chas.**, Paris; about 1710.
- Banbury, John**, admitted C.C. 1685.
- Banfield, Jno.**, 116, Cheapside, 1814-17.
- Banger, Edward**; apprenticed to Joseph Ashby for Thomas Tompion, 1687; admitted C.C. 1695 (see p. 182), 1695-1720.
- Banks, William**, admitted C.C. 1698; on a large lantern clock "Wm. Bankes in Sheffield"; date about 1680.
- **J. C. & B.**, London; watch, 1802.
- **J.**, 68, Long Alley, Finsbury, 1830-35.
- Banister, Henry**, succeeded Jno. Grant the younger, at 75, Fleet St., 1852, and remained there till 1860.
- **Joseph**, Colchester; patented a crutch for clocks in 1836 (No. 7083).
- Bannister, Anthony**, C.C. 1715.
- **Thomas and James**, 39, Kirby St., Hatton Garden, 1825.

- Bannister, James**, 14, Clerkenwell Close, 1820-35; 32, Prince's St., Leicester Sq., 1810-42.
- Banting, William, C.C.** 1646.
- Barachin, Stephen** (French), admitted C.C. 1687.
- Barber, Jonas**, Ratcliffe Cross, admitted C.C. 1682.
- **Wm.**, 30, Cornhill, 1785-94.
- **Benjamin**, 21, Red Lion St., Clerkenwell, 1788-94.
- **Josh.**, 168, Boro', 1795-1817.
- **Hy.**, London; watch, h.m., 1805.
- **Thos.**, 75, Lamb's Conduit St., 1810-17.
- **Abraham**, 56, Cheapside, 1835-40.
- Barberet, J.**, Paris, maker of a cruciform watch, about 1600.
- Barbot, Paul**, Great St., Seven Dials, 1768-69.
- Barclay** (? Barkley), **Samuel**; apprenticed to George Graham, 1722.
- **Hugh**, Edinburgh; 1727.
- **C.**, London; watch, 1815.
- **James**, 7, Jamaica Terrace, Commercial Rd., 1820-42.
- Barcole, John**, admitted C.C. 1648.
- Bareham, Samuel**, 9, Chapel St., Pentonville, 1842.
- Baril, Lewis**, Tokenhouse Yard, 1754-59.
- **Bercher**, 29, Prince's St. near Mansion House, 1763-72.
- Barin, John**, livery, C.C. 1776.
- Barjon, John**, admitted C.C. 1685.
- Barked, Edward**, 2, St. Martin's Churchyard, 1820.
- Barker, William**, admitted C.C. 1632.
- **Benj.**, 21, Red Lion St., 1788.
- **Thos.**, London; watches, 1792-1813.
- **R.** (tools), 4, Benjamin St., Clerkenwell, 1820-25.
- **James**, 38, Colet Place, Commercial Road, 1840-42.
- "Barkley and Colley, Graham's Successors"**; on a long-case clock, with ingenious mechanism for a perpetual diary, about 1765.
- Barlow, Steward, C.C.** 1677.
- (**Booth**), **Edward**, invented the rack striking work and cylinder escapement; born 1636; died 1716 (see p. 82).
- **J.**, London; watch 1798.
- **J. H. and Co.**, 7, Vere St., 1812-20.
- Barnard, Wm.**, London; watch, h.m., 1762.
- **Thos.**, 72, Strand, 1783-1823.
- **and Savory**, 1786-99.
- **and Kidder**, 72, Strand, 1809-12.
- **Jno.**, 36, Little Sutton St., 1817.
- **Franz**, 57, Lemna St., 1840-42.
- Barnes, Ri.**, Worcester; oval watch, S.K.M. about 1600; also an oval watch, now in the Schloss collection, about 1610.
- **Jno.**, Badger Row, Red Lion St., 1794.
- **Thos.**, Lichfield county, U.S.A.; maker of American clocks, 1790.
- Barnett, John**, at y^e Peacock in Lothbury, admitted C.C. 1682.
- **John**, Lothbury, 1686-93.
- **G.**, 10, Staining Lane, Wood St., 1800.
- **J.**, "the corner of Shakespeare's walk, near Shadwell Church, Ratcliff Highway," card Hodgkin collection, about 1790.
- **J.**, 48, Shadwell High St., 1810-15.
- **J. W.**, watch-case maker, 43, Galway St., St. Luke's, 1835.
- **Montague**, 16, Swan St., Minories, 1842.
- Barns and Co.**, 53, Duke St., Smithfield, 1800.
- Barnsdale, John**, City Rd., a well-known clockmaker, 1840.
- Baroneau, Louys**, Paris; fine enamel watch, about 1680.
- Barr, Thos.**, Lewes; lantern clock, about 1700.
- Barratt, P.**, Strand, 1785; 71, Swallow St., 1812; 83, New Bond St., 1830.
- Barraud, Hy.**, presented a spoon to C.C. 1636. See Beraud.
- **Francis and Paul Jno.**, Wine Office Court, 1789-94.
- **Paul Philip**, 86, Cornhill; master C.C. 1810, 1811; 1793-1813.
- **Fredk. Joseph**, Committee of C.C. 1813.
- **and Sons**, 85, Cornhill, 1813-36; 41, Cornhill, 1838.
- **and Lund**, 41, Cornhill, 1838-42.
- Barrett, Robert**, admitted C.C. 1687.
- **Henry**, admitted C.C. 1692.
- **Samuel**, admitted C.C. 1701.
- **Thomas**, admitted C.C. 1702.
- **Joseph**, Cheapside, 1738; clock-watch belonging to Mr. D. Buckney, 4½ inches in diameter, pair of metal gilt cases, the inner one pierced, the outer chased, about 1760; inscribed "Barrett, London."
- **William**, 50, Aldersgate St., 1783.
- **Henry William**, 24, Queen St., Bloomsbury, 1815; 25, Museum St., 1820; 18, Plumtree St., 1835-42.
- **John**, 47, New Compton St., 1820.
- Barrister, Jas.**, 33, Fetter Lane, 1815-17.
- Barron**, —, London; watch, 1830.
- Barrow, Nathaniel**, apprenticed 1653, admitted C.C. 1660; master 1689. In the Guildhall. Museum are an

- astronomical watch and a repeater by him. See page 203. "A large silver chain watch, having two motions, the hour of the day, and the day of the month, with a black case studded with silver, lined with red sattin, and a silver chain to it, made by *Nathaniel Barrow*, in *London*" (*London Gaz.*, July 26-30, 1677).
- Barrow, John**, admitted C.C. 1681, master 1714.
- **Samuel**, admitted C.C. 1696; maker of an eight-day long marquet-erie case clock, 1696-1720.
- **James**, see Brown, Andrew.
- **William**, admitted C.C. 1709; Hatton, 1773, highly esteems the work of a clockmaker named Barrow.
- **Wm.**, Lancashire; came to London before 1744; left London soon after 1746 (Ludlam).
- Barry, Walter**, Still Yard, Tower, 1788-94.
- Bartholomew, J.**, C.C. 1675.
- **Josiah**, 25, Red Lion St., Clerkenwell; maker of a watch, B.M. He was a witness before the select committee of the House of Commons to inquire into the causes of the depressed state of the watch trade in 1817; 1800-42.
- Bartlett, Edward**, London; watch, 1818.
- **H. and G.**, watch-case makers, 3, King Sq., 1830-35.
- Barton, Samuel**, admitted C.C. 1641.
- **Thomas**, Cheapside, 1750-78; Earnshaw challenged him to a contest of work in 1776.
- **T. and J.**, Market St. Lane, Manchester; watch, h.m., 1770.
- **John**, 64, Red Lion St., Clerkenwell, 1780-83.
- **James**, 194, Strand, 1819-23.
- **Thos.**, 7, Bermondsey Sq., 1799-1823; Thos. Mudge, Jun., refers to Thos. Barton as "eminently skilled."
- Bartram, Simon**, petitioner for incorporation of C.C., and one of the first assistants; master 1646; pp. 115, 342.
- **William**, admitted C.C. 1684.
- **and Austin**, 109, 103, Oxford St.; card B.M. 1808.
- Barugh, William**, C.C. 1715.
- Barwick, H. and B.**, 35, Wapping, 1794-96.
- **A.**, Gt. Alie St., 1788-93.
- Barwise, Nathanael**, London; clock-watch, 1710.
- **John**, 29, St. Martin's Lane, 1790; Weston and Jno., 1820-42; in 1841 John Barwise was associated with Alex. Bain in a patent for electric clocks.
- Barwise and Sons**, 24, St. Martin's Lane, 1819-23.
- Baseley, Thomas**, admitted C.C. 1683.
- Basil, John**, 76, St. Paul's Churchyard, 1768.
- Basire, John**, livery C.C. 1760.
- Bass, George**, admitted C.C. 1722.
- Bassett, Chas.**, 58, Upper East Smithfield, 1788-93.
- Bateman**, —; maker of a seventeenth-century oval watch belonging to the Rev. Jas. Beck, mentioned in Vol. xxiii. *Archæological Journal*.
- **H.**, Dublin, 1802-5.
- **Hy.**, 10, Bunhill Row, 1780-85.
- **P. and A.**, 10, Bunhill Row, 1798-1818.
- **Andrew**, 5, Gt. Tower St., 1804-20.
- **Teresa**, 5, Gt. Tower St., 1820-30.
- **Wm.**, 108, Bunhill Row, 1828-32.
- Bates, Thomas**, admitted C.C. 1684.
- **Joseph**, White Alley, Holborn, admitted C.C. 1687.
- **Ed.**, London; a good workman mentioned by Earnshaw, 1780-90.
- **John**, watch pinion maker, 40, Gt. Sutton St., 1820.
- Bath, Thomas**, 4, Cripplegate, 1740.
- Batten, John**, admitted C.C. 1668.
- Batterson, Robert**, C.C. 1693.
- **Henry**, admitted C.C. 1701.
- Battin, Thomas**; a contrate second wheel of a "dial" taken from him, and judged by C.C. to be bad, 1658.
- Batty, Edwd.**, Lancaster, 1826.
- Baudit, Peter**, 4, St. Martin's Lane, 1790-94.
- Baufay, B. and Son**, 3, Bridgewater Sq., 1790-94.
- Baugham, John**, Bridgewater Sq., about 1745.
- Baumgart, Charles**, 37, Dean St., Soho, 1840-42.
- Bautte, J. F.**, Geneva, 1820-25; splendid watch by him, decorated with enamel, belonging to Dr. Pasteur.
- Bawdyson, Allaine**, clockmaker to Edward VI., 1550.
- Baxter, Charles**, admitted C.C. 1680.
- **Man.**, St. Neots; watch, 1723.
- **Pointer**, London, 1772.
- **Wm.**, London; watch, 1790.
- **J. John**, watch-case maker, St. Luke's, 1835.
- **Thos.** (Grimshaw & Baxter), 35, Goswell Rd.; died 1897, aged 54.
- Bayes, John**, brother C.C. 1647, warden 1658; maker of a watch given by Charles I. to Mr. Worsley on his removal to Hirst Castle, November, 1647; another example, a lantern clock, inscribed "Johannes Bayes,

- Londini," date on fret 1643; watch, S.K.M. (see p. 117).
- Bayes, Benjamin**, admitted C.C. 1675.
- Bayford, George**, Upper Shadwell.
- Bayle, Richard**, admitted C.C. 1660.
— **Thomas**, admitted C.C. 1703.
- Bayley, William**, C.C. 1653.
— **Edward**. "A silver watch with a silver studded case, engraven Edwardus Bayley, London" (*Lond. Gaz.*, December 19-22, 1687).
— **Geo.**, London; watch, 1750.
— **John**, 106, Wood St., 1768-75.
— **Thomas**; summoned to take up livery C.C. 1786.
— **and Upjohn**, Red Lion St., Clerkenwell, 1794.
- **Barnard, and Son**, 3, Bridgewater Sq., 1800-5.
- **Richard**, 12, Red Lion St., Clerkenwell, 1807.
- Bayly, John**, admitted C.C. 1700.
— **Richd.**, Ashford; watch, 1770.
- Bayre, James**, admitted C.C. 1692.
- Bayse, Thomas**, admitted C.C. 1695.
- Bazeley, Nathaniel**, C.C. 1694.
- Bazin, Paris**, about 1700.
- Beach, Thomas**, Maiden, Lane, Covent Garden, 1765-70.
- Beal, Martin**, 19, Gerrard St., Soho, 1842.
- Beale, Chas.**, London; watch, 1767.
— **Wm.**, London; watch, 1805.
— **Jas.**, 38, Regent St., 1820-25.
- Beard, Wm.**, Drury Lane, 1812-17.
- Beasley, John**, admitted C.C. 1719.
- Beaton, Andrew**, 22, Cannon Street Rd., St. George's East, 1835.
— **and Campbell**, 110, High St., Whitechapel, 1840.
- "**Beatson**, 32, Cornhill"; McCabe's lowest grade full-plate watches, in silver cases, were so engraved.
- Beauchamp, R.**, 147, Holborn Hill, 1819-23.
- Beaumont**, —; said to have made a clock at Caen in 1314 (see p. 23).
- Beauvais, Simon**, admitted C.C. 1690; a celebrated maker; among his productions is a double-case verge, with a rack and pinion motion work, the hour hand travelling round the dial in twelve hours, but the minute hand travelling only from IX. to III., in one hour, and, when arrived at the III., jumping back to the IX. The hand-setting is between III. and IIIL., and the centre of the dial and motion work are hidden by a small painting on ivory. There is in the B.M. a similar watch of a later period by a German maker; 1690-1730
- Beavin, Hugh**, 34, Marylebone St., Golden Sq., 1800-30.
- Beck, Richard**, "near ye French Church," admitted C.C. 1653.
— **Nicholas**, admitted C.C. 1669.
— **Joseph**, admitted C.C. 1701.
— **Christopher**, Bell Alley, livery C.C. 1787; 1780-94.
— **James**, 5, Sweeting's Alley, Cornhill, 1818-23.
- Becke, John**, admitted C.C. 1681.
- Beckett, Jno.**, 23, Greenhill's Rents, Smithfield, 1796-1803.
- Beckman, Daniel**, admitted C.C. 1680.
"A watch with a double case of Silver, with Minutes, Seconds, and Hours, the name [Beckman] under the Crystal" (*Lond. Gaz.*, March 27-31, 1701).
— **John**, admitted C.C. 1695.
— **Daniel**, admitted C.C. 1726.
- Beckner, Abraham**, Pope's Head Alley, admitted as a brother C.C. 1652, warden and died 1665; known as a maker of oval watches; 1650-65.
- Beckwith, Wm.**, Rotherhithe St., 1794.
- Bedford, Helkiah**, in Fleet St., admitted C.C. 1667; maker of lantern clocks; 1660-80.
— **Wm.**, London; watch, Nelthropp collection, about 1790.
- Beefield, London**; watch, 1760.
- Beeg, Christiana**, admitted C.C. 1698.
- Bell, Joseph**, admitted C.C. 1691.
— **Benjamin**, admitted C.C. 1660, master 1682; maker of a large verge watch weighing over 8 ozs., 1660-83.
"Taken way by 4 Highwaymen in Maiden-head Ticket, A plain silver chain watch made by Benjamin Bell, the case lined with Red Satten, on the back of the case a Perpetual Almanack and little spikes placed at every Hour" (*Lond. Gaz.*, July 7-10, 1690).
"Lost on the 2nd inst., a gold watch with one motion, having a gold chain and a steel hook; made by Benjamin Bell. Whoever brings it to Mr. Sweetapple, a Goldsmith in Lombard Street, shall have 2 guineas reward" (*Lond. Gaz.*, May 4-7, 1691).
"Lost a silver watch with a black case studded with Silver, made by Benjamin Bell, with an Onyx Stone in a gold Ring tied to the watch in which is engraven the Head of King Charles the First. Whoever brings the said watch and seal to Mr. William Penrice, at the Black-Boy in Gracechurch Street, shall have 2 guineas reward" (*Lond. Gaz.*, December 3-7, 1691).

- Bell, John**, admitted C.C. 1719.
 — **Joseph**, Shoe Lane, 1759.
 — **Wm.**, 2, Clement's Lane, 1812-18.
 — **John**, musical clock maker, 8, Elm St., Gray's Inn Lane, 1835-40.
 — **James**; watch, h.m., 1792; 131, Mount St., Berkeley Sq., 1842.
Bellamy, Adey, 10, Poultry, 1779-85.
Bellard, John, admitted C.C. 1674.
Bellefontaine, A., 59, Brewer St., Summers Town, 1835.
Belliard, Chas., Pall Mall, 1769-94.
Bellin. See Mott and Bellin.
Bellinger, John, admitted C.C. 1725.
Bellinghurst, Henry, Aldersgate St., liveryman C.C. 1776; 1765-77.
Bellis, Jas., 9, Pall Mall, 1769-88.
Belsey, John, Poland St., 1835.
Benfey, B., and Son, 3, Bridgewater Sq., 1794.
Benford, John, 1, Garnault Place, Clerkenwell, 1832-38.
Benjamin, A., 3, Myrtle St., Hoxton, 1835.
 — **Joel**, 12, Bury St., St. Mary Axe, 1820-35; J. Benjamin and Co., 1840.
 — **M.**, Berner St., Commercial Rd., 1820; 77, Leman St., 1840-42.
Benn, Anthony, 1750; died when master C.C. 1763.
 — **Robert**, admitted C.C. 1716.
Bennett, Mansell, Dial and 3 Crowns, Charing Cross, C.C. 1685-99; fine long-case clock, S.K.M., about 1695.
 — **Thomas**, owner of movement condemned by C.C. 1677.
 — **John**, admitted C.C. 1678.
 — **William**, admitted C.C. 1692.
 — **John**, admitted C.C. 1712.
 — **Richard**, admitted C.C. 1715.
 — **Samuel**, admitted C.C. 1716.
 — **Thomas**, apprenticed to Windmills; admitted C.C. 1720.
 — **William**, admitted C.C. 1729.
 — **R.**, 159, Fleet St., 1817.
 — **Joseph**, 60, Red Lion St., Holborn, 1835-38.
 — **Wing, and Co.**, 60, Red Lion St., Holborn, 1840.
 — **E.**, Stockwell St., Greenwich, 1840.
 — **John**, 45, Seymour Place, 1842.
Benoit, A. H., Versailles, born 1804, died 1895.
Bensley, J., maker of a watch for the Duke of Sussex, 1790-1820.
Benson, Samuel, C.C. 1700; watch, 1730.
 — **William**, watch and clock spring maker, 60, St. John's St., 1818-23.
 — **Robt.**, 16, Wilderness Row, 1818-40; auditor Watch and Clockmakers' Pension Society, 1820.
Bentley, John, 5, Pope's Head Alley, 1820; 5, Sweeting's Alley, 1823.
 — **and Beck**, 1815.
Benton, Wm., London; watch, h.m., 1825.
Benwell, B., London; watch, 1785.
Beraud, Henry, Sedan, 1565.
 — **Jas.**, 1632.
 — **Hy.**, maker of a watch in the form of a shell, silver case enamelled, crystal over dial, about 1650.
Beresford, Thos., London; watch, 1828.
Berg, F. L., Augsburg, table clock, Nelthropp collection, 1719.
Bergstien, Lulam, 116A, Great Titchfield St., 1842.
Berguer, John, 44, Great Russell St., Bloomsbury, 1810-20.
 — **Frederick**, 201, High Holborn, 1810; 135, High Holborn, 1818-20.
 — **Franz**, 17, Vere St., 1817.
 — **Charles**, musical clockmaker, 13, Richmond Buildings, Soho, 1825.
Berkenhead, John, 31, Gutter Lane, 1783-94.
Berkley, London; watch, 1810.
Berman and Co., 30, Park Terrace, Regent's Park Rd., 1830-35.
 — **J., and Co.**, wooden clockmakers, 40, Norton Folgate, 1830-35.
Bernard, Nicholas, Paris; maker of a watch at S.K.M., about 1700.
Berninck, Jan., Amsterdam; maker of a watch, B.M., which has a French enamelled inner case by G. Bouvier, and an outer *repoussé* case by H. Manley, about 1750.
Berquez, Francis, 17, Vere St., 1822; 6, Thayer St., Manchester Sq., 1825-35.
Berrand, see Barraud.
Berres, T., London; watch, h.m., 1793.
Berridge, Jno.; made a clock with compensated pendulum in 1738 to the order of Mr. Fotheringham, a Quaker of Lincolnshire.
 — **Wm.**, 69, Oxford Rd., 1780-94.
 — **Robert**, 2, John St., Oxford St., 1790-95.
 — **William**, 4, Holles St., Cavendish Sq., 1800-25.
Berrington, Uriah, C.C. 1684.
Berrollas, Joseph Anthony, Denmark St., St. Giles-in-the-Fields, 1808; Coppice Row, Clerkenwell, 1810; afterwards 51, Wellington St., Goswell Rd.; an ingenious watchmaker. In 1808 he patented a repeater somewhat similar to Elliott's (p. 356), in 1810 a warning watch, in 1827 an alarm watch, also pumping keyless work (p. 352); 1800-30.
Berry, John, St. Clement's Lane, admitted C.C. 1688, master 1723;

- maker of a long-case clock at Merchant Taylors' Hall, arch dial, brass figures holding trumpets on top of case; 1688-1730.
- Berry, Samuel**, admitted C.C. 1705.
 — **Francis**, Hitchin; maker of lantern clocks, about 1700.
 — **Wm.**, London; watch, 1815.
 — **John**, admitted C.C. 1728.
 — **Frederick**, 2, Arcade, Hungerford Market, 1842.
- Berthoud, Ferdinand**, born 1745, died 1807; an eminent French watchmaker, author of "Essai sur l'Horlogerie," "Traité des Horloges Marines," "Histoire de la Mesure du Temps," and other works containing a mass of useful information concerning the history, theory and practice of the horological art, dealing with Harrison's, Sully's and Le Roy's inventions, and, indeed, everything known in Berthoud's time.
- Bertram, William**, died in 1732, when master C.C.
- Bertrand, Robert**, 2, Stewart St., Spitalfields, 1790-94.
- Besse, Jeremy**, 4, Richmond Buildings, Soho Sq., 1840-42.
- Best, Thos.**, 3, Red Lion St., Clerkenwell; between 1770 and 1794 he made a large number of watches for the Dutch market; he was also known as a maker of musical clocks and watches.
 — **Robert**, 5, White Lion Court, Birchin Lane; a watch by him, S.K.M., hall mark 1769; 1765-88.
 — **T.**, at the Dial in Lewes; card, B.M., 1780.
 — **Thos.**, Newcastle; watch, 1785.
 — **Robert** (formerly foreman to Brockbank), 4, White Lion Court, Birchin lane, 1790; 4, Sweeting's Alley, 1798; 1, Windsor Place, St. Paul's, 1810-20. He attested the value of Earnshaw's improvements in 1804.
 — **Richard**, 3, Fountain Court, Strand, 1835-42.
- Besturck, Henry**, admitted C.C. 1686.
- Bethell, R.**, London; watch, 1760.
- Betson, J.**, London; watch; 1797.
- Betts, Samuel**, back of Exchange; short train watch by him, about 1645 (see p. 172). In 1656 he attested the genuineness of Jas. Lello's masterpiece to C.C. Died prior to 1675 (see Marquet).
 — **Job**. "Stolen from Cheyne Rowe, of Walthamstowe, in Essex, Esq., a gold watch with a gold chain made by Job Betts, with a silver Drinking Cup and other Plate. Whoever brings the said watch and chain or the watch only to Mr. Johnson, Jeweller, at the 3 Flower-de-Luces in Cheapside, shall have 20s. reward, and charges; or if pawned or sold their money again with content" (*Lond. Gaz.*, August 11-15, 1692).
- Betts, Samuel**, apprenticed to Samuel Davis for Job Betts 1675; admitted C.C. 1682; maker of a calendar watch with revolving ring dials, to which a figure of Time points. Dover Museum. In the Guildhall Museum is another specimen of his work; 1682-1700.
- Bezar, Stephen**, admitted C.C. 1648.
- Bibley, Jno.**, Corporation Row, 1790-94.
- Bickerton, Benjamin**, 14, Jewin St., 1795-1810.
 — **T. W.**, 14, Jewin St., 1816-20.
- Bickley, Thomas**, 195, Ratcliff Highway, 1790-94.
- Bicknell, Francis**, C.C. 1665.
 — **Joseph, and Co.**, 119, New Bond St., 1807-13.
- Bickton, Geo.**, London; watch, 1775.
- Biddle, Joseph**, admitted C.C. 1684.
- Bidlake, Jas.**, 31, Minories, 1765-94.
 — **James**, 16, Sun St., 1798-1804; livery C.C. 1816; 48, Chiswell St., 1816-20.
 — **Thomas**, 16, Sun St., Bishopsgate St., 1804-18; livery C.C. 1818.
 — **James, and Son**, 48, Chiswell St., Finsbury, 1820-40.
- Bidles, Thomas**, London; maker of bracket clocks, about 1790.
- Bidley, Wm.**, 24, Rahere St., Clerkenwell, 1840-42.
- Biefield, Chas.**, London; watch, 1780.
- Biggs, Roger**, 5, Crescent, Jewin St., 1800.
- Bilbee, London**; long-case 30-hour clock, one hand, about 1710.
- Bilbie, Edwd.**, Chew-stoke; long-case clock, about 1700. The Bilbies were a well-known Somerset family of clockmakers. The following is from an upright gravestone at Oxbridge:—
 "Bilbie, thy
 Movements kept in play
 For thirty years or more,
 We say,
 "Thy Balance or thy
 Mainspring's broken,
 And all thy movements
 Cease to work.
 "John Bilbie, of this parish, clockmaker, who died Sept. 13, 1767, aged 34 years."
- Bilger, Matthias**, watch spring maker, 4, New St., Covent Garden, 1790-94.
- Bille, John**, admitted C.C. 1687.
- Billing, H. C.**, Cheapside, 1835.

Billinghurst, Henry, 67, Aldersgate St., livery C.C. 1766; 1760-71.
Billop, William, admitted C.C. 1688.
Bindley, William, 24, Rahere St., 1842.
Bingham, Thos., watch chain maker, 3, Middle Row, Holborn, 1769-81.
 — **William**, 27, Bucklersbury, 1842.
Binks, —, watch, Guildhall Museum, about 1820.
Binley, J. W., Ironmonger Row, Old St., 1790.
Binns, George, 137, Strand, 1832-38.
Birch, Thomas, admitted C.C. 1682.
 — **William**; succeeded Wm. Turner at 173, Fenchurch Street about 1840.
Birchall, Wm., 5, St. James's Walk, Clerkenwell, 1816; 5, Wellington St., 1834-42.
 — **Peter**; a well-known chronometer maker. In partnership with Appleton, he succeeded Molyneux at Southampton Row; shortly after Appleton's death he disposed of the business to Wm. Cribb; lived subsequently at Islington; died 1885, aged 85.
Bird, Michael, brother C.C. 1682; maker of a bracket clock inscribed "Michael Bird, London." On a thirty-hour clock, one hand, period about 1650, was inscribed "Michael Bird, Oxon."
 — **Wm.**, London; watch, 1760.
 — **Luke**, admitted C.C. 1683.
 — **Thos.**, London; watch, h.m., 1753; 10, Salisbury St., Strand, 1816.
 — **John**, one of the examiners of Harrison's timekeeper, 1765.
 — **and Branstor**, 30, Cheapside, 1775.
 — **Jacob**, 7, Cornhill, 1783.
 — **Samuel Joseph**, watch case maker (apprenticed to Jasper Swindells), Little Compton St., C.C. 1813.
 — **Rich.**, watch chain maker, Bartlett's Buildings, 1794.
 — **John, and Son**, 19, Bartlett's Buildings, Holborn, 1822-25.
 — **John**, 11, St. John's Sq., 1840-42.
Birdwhistell, Francis, C.C. 1687.
 — **Isaac**, admitted C.C. 1692; maker of a plain pair-case gold watch, small swivel bow to the inner case, larger bow on the outer one, high movement, very rich gold dial, nicely wrought square pillars, finely engraved and pierced balance cock, excellent work throughout; 1692-1705.
 — **Thomas**, C.C. 1693.
 — **John**, admitted C.C. 1718.
Birkhead, Nicholas, removed from King's Head, Holborn, to White

Hart, Knightsbridge (*Lond. Gaz.*, May 29, June 1, 1693).
Birley, J., Sheffield; curious watch, one hand, "1638" on metal dial in place of name; probably made a century after that date.
Bishop, Samuel, Portland St., 1770-94; hon. freeman of C.C. 1781.
 — **James Griffin**, 97, Fetter Lane, 1816-24.
 — **Thos.**, London; watch, date on movement, 1810.
 — **William**, 70, New Bond St., 1830.
Bishridger, William, of Dorking, fecit; old square bracket clock, period 1700.
Bisse. See Bysse.
Bissett, Jas. (late Gibson), 12, Sweeting's Alley, Royal Exchange, 1815-20.
Bittleston, John, 207, High Holborn, 1765-94; hon. freeman C.C. 1781. Example of his work—a very curious astronomical watch, with two elaborate enamel dials—one at the front, and one at the back—showing the hour and minute both sides, two centre seconds—one the usual long hand, the other having a small rotating enamel dial—day of the month, day of the week, the month, moon's age, the tide, and a regulator; case pinchbeck, with a border each side of fine old paste in imitation of rubies and diamonds.
Bittner, William, 26, Dean St., 1840-42.
Blackborow, James, died 1746, when warden C.C.; 1734-46.
Blackbourn, Saml., London; watch, about 1780.
Blackburn, William, summoned to take up livery C.C. 1786.
 — **Jno.**, watch-spring maker, 20, Aldersgate St., 1789-99; watch so named, 1790.
 — **Robt.**, Lancaster, 1817.
Blackhall, J., London; watch, 1800.
Blackie, George, born in Scotland; settled in Clerkenwell as a duplex escapement maker and manufacturer; afterwards had a shop at 431, Strand; died 1885, aged 74.
Blacksmith, Robt., London; watch, 1831.
Blackwell, J., 43, Plumber St., City Rd., 1820.
Blake, Wm., Whitecross St., 1789-90.
 — **Chas.**, 14, Bishopsgate Within, 1813.
Blanchard, Robt., within Temple Bar, 1675.
 — **Charles**, London; maker of a chiming quarter bracket clock, square black case, strike-silent, bronze handle on top, about 1760.

- Bland, Jas.**, 33, Norton Folgate, 1816-23.
- Blandford, Hy. W.**, London; watch, 1794.
- Blay, William**, 6, Princes St., Leicester Sq., 1825.
- Bligh, Thomas**, watch-case maker, 37, Great Sutton St., 1820.
- Bliss, Ambrose**, admitted C.C. 1653; signed a petition in 1656.
- Blissett, Isaac**, 70, Leadenhall St., 1823.
- Blog**, —, 129, Aldersgate St., 1825.
- Bloud, Ch.**, à Dieppe, 1660.
- Blundell, Richard**; threatened with prosecution by C.C. for exercising the art, not being admitted; he promised to take up his freedom at the next quarter court, 1682.
- **William**, C.C. 1715.
- **Henry**, musical clockmaker, 7, Red Lion St., 1830. See also Walker and Blundell.
- Blundy, Joseph**, 21, St. John St., Clerkenwell, 1781; Brookes Market, 1790.
- Boak, Samuel**, Golden Spread Eagle, without Aldgate, 1692.
- Boardman, T.**, London; watch, 1774.
- Bobinet, Chas.** (French); watch in circular crystal case, S.K.M., about 1650; also (Salting collection), a cruciform watch in crystal and silver case.
- Bock, Johann**, Frankfort; clock by him, Vienna Treasury about 1630; another example of his work is a watch showing days of the month, about 1640.
- Bockel, Mathys**, Haarlem; oval watch S.K.M., 1610.
- Bockels**, —, Amsterdam; in the Roskell collection was a handsome oval alarm watch by him, of large size, dating from about 1640; the inner case is of silver and the outer one covered with fish skin; on the dial is inscribed "Oliver Cromwell;" the watch now belongs to Mr. Evan Roberts.
- Bockelts**, —; watch B.M., about 1640.
- Bockett, Richd.**, London, 1712.
- Bodd, Thomas**, London, C.C. 1692; watch, 1715.
- Bodenham, Edward**, C.C. 1719.
- Bodily, Elizabeth**, C.C. 1692.
- **N.**, 21, Butcher's Hall Lane, Newgate St., 1823.
- Boisson, M.**, London; watch, 1745.
- Bolt, Jno.**, London; watch, 1820.
- Boncher, A.**, musical watch maker, 23, Frith St., Soho, 1835.
- Bond, G.**, London; watch, 1800.
- Bone, Wm.**, Essex; about 1790.
- Boney, Caleb**, a well-known Cornish clockmaker; died at Padstow, 1827.
- Bonner, Charles**, admitted C.C. 1659.
- **Charles**, admitted C.C. 1704.
- **Thos.**, Fair St., Southwark, 1790-94.
- Bonnington, Wm.**, clock-case maker, 6, Red Lion St., Clerkenwell, 1793-99.
- **and Thorp**, clock-case makers, 22, Red Lion St., 1793-1816.
- Bonny, London**; maker of a repeater centre-seconds watch for the Duke of Sussex, 1790-1820.
- Boone, Edward**, admitted C.C. 1691.
- Boot, Jno.**, clock, about 1735.
- Booth, Jas.**, 20, Little Tower Hill, 1788-92.
- **Jno.**, London; watch, 1780.
- **R.**, Church Hill, Woolwich, 1812-17.
- Bor, J.**, Paris; maker of a fine clock in a square brass case, minutes shown on a small circle below the hour dial, minute hand driven from fusee; about 1590.
- Bordier, Denis**; watch apparently French, crystal case, about 1620; see p. 106.
- **A.**, Geneva; watch, Schloss collection, case beautifully enamelled, about 1785; watch in octagonal case, "Leonard Bordier," S.K.M., 1800.
- **Freres**, Geneva; 1820-30 (see also Roux).
- Borellas, J.**, 15, Spencer St., 1840.
- Borelli, J.**, 8, Aldersgate St., 1790-95.
- Borgin, Henry**, Without Bishopgate, issued a token bearing a dial and hands, about 1677.
- Borrel, A. P.**, Paris; pupil and successor of A. Wagner, born 1818, died 1887.
- Borrell, Henry**, 15, Wilderness Row, 1798-1840.
- **Maximilian, J.**, 19, Wilderness Row, 1830-42.
- Borret, P.**, 5, Staining Lane, Wood St., 1805-16.
- Borrett, Geo.**, Stowmarket; maker of a watch, Guildhall Museum, about 1750.
- **M. M.**, London, about 1790.
- Bosley, Chas.**, Ratcliff Cross, succeeded Wm. Kipling, 1750-66; livery C.C.
- **Joseph**, Leadenhall St., admitted C.C. 1725. In 1755 he obtained a patent for using in watches pinions with more teeth than usual. This involved an extra wheel and pinion, and the balance wheel turned the contrary way. Also for (secondly) a slide index for watches, which has no wheel, but turns upon a brass socket and points to an arc of a circle, with the word "faster" at one end, and "slower" at the other.

- Patent unsuccessfully opposed by C.C. 1725-63.
- Bosley, Charles**, livery C.C. 1766.
- Boucher, W.**, 4, Long Acre, 1820.
- Boucheret, Jacob**, C.C. 1728.
- Boudry, Gustavus**, 64, Frith St., Soho, 1826-42.
- Boufler**. See De Boufler.
- Bouguet**. See Bouquet.
- Boult, Joseph**, admitted C.C. 1709.
- **Michael**, Cheapside, 1738.
- Boulter, Samuel**, 12, Gloucester Place, Chelsea, 1840-42.
- Boulton, Job**, at the "Bolt and Tun," Lombard St., had a gold and a silver watch with other jewellery stolen in 1683.
- **T.**, watchcase maker, 49, Gray's Inn Lane, 1820.
- Bouquet, David**, London; C.C. 1632; maker of a watch in the B.M., fine case enamelled in relief and encrusted with jewels; another and earlier example, Mainwaring collection, an oval watch with covers back and front (see p. 119); in the Dunn Gardner collection, S.K.M., is a watch in a finely enamelled case, the movement clearly signed "D. Bouquet, Londini," 1610-40. "A Pocket Clock made some years since by Mr. Bognett, of Black Fryars, Watchmaker, it hath two Silver Cases, the outmost plain, the other wrought; two Brass Keys, one of the usual form, the other forked for turning the hand of the Alarum, tied to a Silver Chain; it hath the day of the Month, Tides, age of the Moon, and some other motions, it strikes every hour" (*Lond. Gaz.*, March 3-7, 1639).
- "Lost the 15 instant, between Rosse and Linton in Herefordshire, a watch with an alarum in a Silver Case, with a Silver Chain, the case lined with Crimson Satten, being an old piece; the name of the maker being exprest thus, *Daniel Bouquet, Londres*" (*Lond. Gaz.*, June 19-22, 1696).
- **Solomon**, admitted C.C. 1650; a celebrated maker, 1650-70.
- **Solomon**, admitted C.C. 1683; in the B.M. is a watch of his with highly engraved gold cases, 1680-1700.
- Bourchier, W.**, 13, Broad St., Long Acre, 1835.
- Bourelie, John Francis**, Arundel St., Strand, 1769-83.
- Bouillard, Paul**, "at the Eagle and Pearl in Great Suffolk St., near the Haymarket," card Ponsonby collection, about 1775.
- Bourne, Aaron**, Maiden Lane, Covent Garden, 1769.
- Boursault, Helie**, Chatellerault; about 1630.
- Bouteville and Norton**, 175, Aldersgate St., 1810-19.
- **Wm. Hy.**, 1823.
- Bouts, David**, last representative of Parkinson and Bouts, Gracechurch St.; died 1883, aged 61.
- Bouvier, G.**, a well-known French painter of watch cases in enamel, about 1750.
- Boverick, —**. "To be seen at Mr. Boverick's, Watchmaker, at the dial, facing Old Round Court, near the New Exchange, in the Strand, at one shilling each person, the furniture of a dining-room in a cherry-stone, a landau with horses complete, so minute as to be drawn along by a flea; 4-wheeled open chaise weighing one grain, so small, drawn by flea also; a flea chained, 200 links, padlock and key all weighing one-third of a grain; and steel sizzors so minute that six pairs could be wrapped in wing of fly, but cut large horse hair." Handbill 1745.
- Bowen, Richard**, maker of a large silver watch with two cases, the outer one chased and engraved with a border of flowers and the figure of the king praying, and the words, "And what I sai to you I sai unto all, WATCH." Said to have been given by Charles I. while at Carisbrooke, to Colonel Hammond, 1647. "Lost, a watch in black shagreen studded case, with a glass in it, having only one Motion and Time pointing to the Hour on the Dial Plate, the spring being wound up without a key, and it opening contrary to all other watches. R. Bowen, Londini, fecit, on the back plate" (*Lond. Gaz.*, Jan. 10-13, 1686).
- **Francis**, apprentice to John Bowyer; brought his masterpiece on completion of his indentures, and was admitted C.C. 1654.
- **John**, admitted C.C. 1709.
- **Thomas**, 6, Charing Cross, 1797-1813; livery C.C. 1811.
- **John**, 143, Long Acre, 1807-10; 2, Tichborne St., Haymarket, 1812-42 (Bowen and Holt, 1814-18).
- Bower, Jno.**, London; large lantern clock, dolphin frets, about 1690.
- Bowley, Devereux**, 54, Lombard St., a well-known maker of repeating clocks; born 1696, died 1773; master of C.C. 1759; was a member of the

- Society of Friends, and bequeathed a large sum to their school in Clerkenwell, as well as £500 to the C.C.
- Bowman, Jas.**, London; watch, 1815.
- Bowness, Geo.**, Lancaster, 1820.
- Bowrd** (Bowra?) **John**, 4, Holles St., Oxford St., 1820-23.
- Bowell, Samuel**, admitted C.C. 1681.
- **William**, C.C. 1703.
- Bowyer, Wm.**, a good maker. Subscribed for incorporation of C.C. In 1642 he presented to the C.C. a great chamber clock, in consideration of his being thereafter exempted from all office and service, as well as quarterage and other fees (see p. 302), 1623-42.
- **Jno.**, possibly successor to Wm. See Bowen, F., and Bower.
- Box, John**, 17, Ludgate St., 1775-83.
- **William B.**, Clerkenwell; died 1892, aged 76.
- Boyce, Jas.**, London; maker of a long marqueterie case clock, square matted dial, circles round winding holes, silvered ring, angel and crown corners, about 1720.
- Poyer, T.**, London; maker of lantern clocks, about 1690.
- Boyle, William**, 11, Arundel St., Strand, 1840-42.
- Boys, A., and Duduict Jaques**, makers of a large clock-watch, Guildhall Museum, about 1700.
- Bracebridge and Pearce**, Coppice Row, 1800.
- **Edward**, 8, Red Lion St., Clerkenwell, 1805-15. (Bracebridge and Sons, 1816-18.)
- **J. and E. C.**, 8, Red Lion St., Clerkenwell, 1820-42.
- **James**, treasurer to the Watch and Clockmakers' Benevolent Institution; died 1892, aged 66.
- Brackenrig, Robert**, Edinburgh, made an escapement similar to the duplex, 1770.
- Brackley, George**, C.C. 1677.
- Bradford, Thomas**, C.C. 1680.
- **Thomas**, admitted C.C. 1692.
- **R.**, London; Mr. Eden Dickson has a small watch by him, with fine gold dial, about 1700.
- **Thomas**, Strand; C.C. 1710.
- **Hy.**, 89, Bethnal Green Rd., 1820.
- Bradin, Caspar**, admitted C.C. 1715.
- Brad, Anthony**, Augsburg, 1680.
- Bradley, Henry**, admitted C.C. 1681.
- **Langley**, Whitechapel, afterwards in Fenchurch St.; apprenticed to Joseph Wise, 1687; admitted C.C. 1694; master in 1726; maker of the St. Paul's and other turret clocks (see p. 207). A watch by L. Bradley in B.M., period 1696.
- Bradley, Benjamin**, admitted C.C. 1728.
- **L. and B.**, made a clock for Bancroft's School, Mile End, the date on the bell being 1734. The clock is now in Bancroft's new School at Woodford.
- **Wm.**, London; watch, h.m., 1784.
- **John H.**, 3, Great Russell St., Bloomsbury, 1842.
- Bradshaw, Richard**, C.C. 1725.
- **John**, admitted C.C. 1731.
- **and Ryley**, Coventry, 1760.
- Bræmar, Gerrett P.**, Amsterdam; repeating watch, S.K.M., about 1735.
- Brafield, William**, admitted C.C. 1678; fined 5s. by C.C. in 1638 for making a bad watch-case.
- Braithwaite, Geo.**, Lombard St., 1738.
- **and Jones**, Cockspur St.; the Hon. Gerald Ponsonby has a fine repeater by them, about 1800.
- Bramble, Joshua**, 407, Oxford St., 1804-35.
- **Wm. and Edwd.**, 407, Oxford St., 1840.
- **Eliza**, 9, Wells St., Oxford St., 1842.
- Brambley, Joseph**, 10, Maiden Lane, Wood St.; in 1797 founder and citizen; petitioned against being compelled to take up freedom in C.C. 1783-97.
- Brand, Alexander**, Edinburgh; 1727. Though not apprenticed in Edinburgh he was by favour admitted to the Incorporation of Hammermen, and in return presented a clock which is still in Magdalen Chapel, Cowgate, then the meeting-place of the Incorporation.
- Brand, C.** (see Brandt), musical watch-maker to H.M., 23, Frith St., 1814-19.
- Brandon, Benjamin**, C.C. 1689.
- Brandreth, Joseph**, C.C. 1718.
- Brandt, Chas.**, musical watch maker, 74, New Compton St., 1815; 82, Theobald's Rd., 1820; 145, Regent St., 1825; 22, Upper Belgrave Place, Pimlico, 1835.
- Branster and Bird**, 39, Cornhill, 1775.
- Brant, Richard**, admitted C.C. 1700.
- Brasbridge, Joseph**, 98, Fleet St., 1794.
- **and Son**, 198, Fleet St., 1825.
- Bray, Robert**, admitted C.C. 1728.
- **Thomas**, St. Margaret's Churchyard, 1798-1804; 8, Little Queen St., Westminster, 1807-25.
- **Wm.**, 171, Tottenham Court Rd., 1840.
- Brayfield, William**, C.C. 1712. "Drop'd the 21st December, in Little Weld-

- St., or thereabout, a middle siz'd Silver Minute Pendulum watch, going Thirty hours, with a chain, in a silver case, the name William Brayfield, London. Whoever brings it to Remond Regard, Clockmaker, at the upper end of Russell St., near Drury Lane, shall have 40s. reward" (*Lond. Gaz.*, January 25-28, 1691).
- Brayfield, John**, admitted C.C. 1716.
- Brayley, Joseph**, 6, Little Guildford St., Bernard St., Russell Sq., card Hodgkin collection, about 1810.
- Breakspear and Co.**, Oxford St., 1807.
- Brebent, Peter**, London; repeating watch, about 1690.
- Breese, Jas.**, 5, North Place, Gray's Inn Rd., 1842.
- Bréguet, Abraham Louis**, born 1746, died 1823; a French watchmaker of rare attainments and inventive power. Berthoud, who was Bréguet's senior by two years, ends a brief notice of his brilliant contemporary thus, "Il n'a rien publié." Bréguet lived sixteen years longer than Berthoud, but, unfortunately for us, it must still be recorded "he published nothing." See p. 249.
- **Louis Antoine**, son of the above, retired 1833.
- **Louis**, son and successor of L.A., born 1804, died 1883. (See Brown, Edwd.)
- Brentwood, Wm.**, London; watch, 1775.
- Breton, Henry**, keeper of the Westminster clock, 1413.
- Bretonneau, Auguste**, Paris; a watch by him belonging to Earl Amhurst, described in *Archæological Journal*, vol. xvii., enamelled; Holy Family on one side, St. Catherine on the other, about 1680.
- Brett, Jas.**, lantern clock, about 1695.
- **Thos.**, London; bracket clock, about 1730.
- Brewer, John**, admitted C.C. 1677.
- **Richd.**, Lancaster, 1783.
- **J.**, 25, New Surrey St., Blackfriars, 1810-15.
- **W.**, 149, Gt. Surrey St., Blackfriars, 1825.
- Breynton, Vaughan**, C.C. 1693.
- Brickle, William**, 5, Church St., Mile End, 1842.
- Bridge, Thos.**, London; clock about 1720.
- **Edwd.**, London; watch, 1802.
- Bridgden, Henry**, C.C. 1682.
- Bridgeman, Edwd.**, Russell St., Covent Garden, C.C. 1662.
- Bridger, Samuel**, admitted C.C. 1703.
- Bridges, Henry**, Waltham Abbey (see p. 260), about 1740.
- **Robt.**, London; watch 1784.
- Briggs, John**, "a cutter of glasses for watches," brother C.C. 1669.
- Bright, J.**, 72, Long Acre, 1790-94.
- **Richard**, 9, Foster Lane, 1815-26.
- Brimble and Rouckliffe**, Bridgewater, 1770; clock by them belonging to Mr. Edwin Ash, their names are also on the weather-cock of St. Mary's church, Bridgewater.
- Brind, Walter**, 34, Foster Lane, 1783-88.
- Brinkman, George**, 12, Union St., Bishopsgate, 1815-40.
- **and Gollin**, 1842.
- Briscoe, Stafford**, at the "Three Kings and Golden Ball," Cheapside, 1738-59.
- **and Morrison**, 1763 (see Morrison, Richd.).
- **Sam.**, London; watch, 1810.
- Bristow, Wm. G.**, 6, Hoxton Fields, 1820-35.
- British Watch Company**, Soho, formed in 1843, to manufacture watches with duplicating tools invented by P. F. Ingold. An excellent watch was designed and several were made, but the "trade" successfully opposed the application to Parliament for an Act of Incorporation, and the enterprise came to a close. Ingold afterwards went to America; and although he was not successful in forming a company there, it is said that some of the tools made for the British Watch Company formed the nucleus of the American factory system.
- Brittayne, Stephen**, C.C. 1692.
- Britten, S.**, watch-glass maker, 11, Charles St., Hatton Garden, 1835.
- Britton, Stephen**, admitted C.C. 1728.
- **Sandys**, 48, Wynyatt St., 1835.
- Broad, Thomas**, admitted C.C. 1682.
- **R.**, 204, Bermondsey St., 1820.
- **Wm.**, 53, Leadenhall St., 1804-30.
- Broadhead, Benjamin**, C.C. 1709.
- Broadley, Jas.**, 24, Wood St., 1772.
- Broadwater, Hugh**, C.C. 1692.
- Brock, John**, foreman to E. J. Dent, afterwards at 18, George St., Portman Sq.; died 1893.
- Brockbank, John**, apprenticed to Joseph Hardin, 1761; admitted C.C. 1769; livery 1777; 7, Queen St., Cheapside (card Hodgkin collection), afterwards at 5, Cowper's Court, Cornhill.
- **John and Myles**, 6, Cowper's Court. Myles was the son of Edward Brockbank, of Corners, in Cumberland, and was apprenticed to his brother John, at 17, Old Jewry,

- 1769; admitted C.C. 1776. They were eminent chronometer makers; John died early in the present century, and Myles retired about 1808. They were succeeded by their nephews, John and Myles Brockbank, who for a few years carried on the business as John Brockbank and Company.
- Brockbank and Grove**, 6, Cowper's Court, 1812-15.
- **and Atkins**, 6, Cowper's Court, 1815-35.
- **Atkins, and Son**, 6, Cowper's Court, 1840-42.
- Brockhurst, Thos.**, Coventry; clock about 1720.
- Brocot, Achille**, Paris; a celebrated clockmaker, born 1817, died 1878.
- Brogden, James**, 148, Aldersgate St., liveryman C.C. 1765-94.
- Brogden and Marriott**, 148, Aldersgate St., 1770-1804.
- **James**, 6, Bridgewater Sq., 1820-28.
- **and Garland**, 1830.
- Bronson, Jno.**, London; maker of long case and bracket-clock, 1760-80.
- Brook, Edmund**, admitted C.C. 1709.
- **Richard, and Son**, Poultry, 1795-1802; Richard Brook, 1804-18; C.C. 1810.
- Brookhouse and Tunnicliffe**, Derby; watch, Mr. H. Cook; on plate, "Brookhouse's improved rolling lever"; the impulse pin was a pivoted roller such as Emery made, h.m., 1819.
- Brooke, John**, admitted C.C. 1632.
- **George**, admitted C.C. 1681.
- **William**, 192, Upper Thames St., 1783-94.
- Brooker, Richard**, C.C. 1694.
- Brookes, Edward**, C.C. 1690.
- **Josh.**, London; watch, 1810.
- **Samuel**, watch-case maker, 5, Ashby St., Clerkenwell, 1835.
- **George**, London; watch, 1700.
- Brooks, William**, Church Row, Aldgate, liveryman C.C. 1776; watch, 1790. "Wm. Brooks, Pentonville."
- **John**, 115, Bunhill Row, liveryman C.C. 1786-88.
- **Thomas**, watch-case maker, 22, Golden Lane, 1790-94.
- **John**, 4, Bridgewater Sq., 1794-1813.
- **W.**, 14, Clerkenwell Green, 1825.
- **J. W.**, watch-spring maker, 5, Berkley Court, Clerkenwell, 1835.
- Broome, Thomas**, admitted C.C. 1652.
- Broomhall, Chas.**, 41, Stanhope St., 1794.
- Bross, John**, 106, Britannia St., City Road, 1820-35.
- Browner**, London; watch, 1830.
- Brown, James** (Croydon), C.C. 1687.
- **Andrew**, Edinburgh; apprentice to Humphrey Mylne, made a freeman of the Incorporation of Hammermen in 1675, his essay being, "Ane knock with a watch luminary globe upon the dial." Died 1712.
- "James Barrow, aged about twenty, of a low stature, a little pock-marked, speaks the English accent, had on when he went away a short flaxen coll-cut wig, in an ordinary habit, run away from his master the nineteenth instant with a plain gold watch without a crystal (glass), with an enamelled dial. The enamelling on the figures is broken off. A silver pendulum watch, made by William Young, at Charing Cross, London, with a shagreen case; the centre and balance wheels pierced. A plain silver watch and an oval brass watch and several other things. Whoever can secure the said youth, and give notice thereof to Captain Andrew Brown, watchmaker in Edinburgh, shall have two guineas reward" (*Edinburgh Gazette*, 1699).
- The title of "Captain" refers to Brown's position in the Trained Band which was organized to defend the City.
- **Jno.**, Edinburgh, 1720.
- **Philip**, admitted C.C. 1688.
- **Thomas**, admitted C.C. 1703.
- **Henton**, Borough, admitted C.C. 1726; master, 1753; livery, 1766; a maker of fine watches; 58, Lombard St., in 1754.
- **Jas.**, Birchin Lane, liveryman C.C.; master, 1770.
- **Thos.**, Chester; member of the Goldsmiths' Company, 1773.
- **Nathaniel**, Whitefriars, liveryman C.C. 1776.
- **John**, 118, Fleet St., 1775-83.
- **John**, 76, St. Paul's Chyd., 1769-83.
- **Thos.**, Birmingham; watch, silver cock, h.m. 1761.
- **John Wm.**, 14, Cheapside, 1769-83.
- **Thos.**, Bunhill Row, liveryman C.C. 1776.
- **John**, 30, Grafton St., Soho, 1790-94.
- **J.**, 119, Holborn; card B.M. 1798.
- **J.**, King St., Seven Dials; an excellent cutter of clock-wheels on an engine designed by Hindley, 1780-1810.
- **Richard**, watch-key and pendant maker, Greenhill's Rents, 1790-94.

- Brown, Thos.**, 14, Cheapside, 1788-1800.
 — **Wm.**, 40, Piccadilly, 1800-10.
 — **John**, 65, Charing Cross, 1783-1810.
 — **Geo.**, 8, Great Sutton St., 1820.
 — **James**, 56, George St., Portman Sq., 1810-42.
 — **George**, watch-case maker, 14, St. James' Bldgs., Clerkenwell, 1835.
 — **Isaac**, 32, Gloucester St., Clerkenwell, maker of bezel winding watches, patented 1829, No. 5851; 1820-35.
 — **James**, 60, Rahere St., 1842.
 — **Roger**, 25, Shepherd St., Mayfield, 1842.
 — **Edwd.**; an accomplished horologist, head of the house of Breguet, died at Paris, 1895; aged 66.
Browne, Matthew, C.C. 1633.
 — **John**, admitted C.C. 1652; master 1681.
 — **Richard**, at y^e Green Dragon in Cheapside, on lantern clock, gallery frets, bob pendulum, C.C., 1675. "A watch having two motions, Richard Brown being engraved on it, in a studded case" (*Lond. Gaz.*, June 16-20, 1687).
 — **Chas.**, London; watch, 1820.
Brownlie, Alexander, Edinburgh, 1710-25.
Brown, Thos., London; watch, 1799.
Bruce, James, admitted C.C. 1721.
 — **George**, London; long-case clock, about 1740.
 —, Cranbourne St., Leicester Sq., watch, 1830.
Brugercia, C., musical snuff-box and clockmaker, 13, Richmond Buildings, Dean St., 1820.
Brugger, John, 252, High Holborn, 1830.
 — **Beck, and Co.**, 15, Crown St., Finsbury, 1840-42.
 — **L. A.**, wooden and musical clock-maker, 79, High Holborn, 1840-42.
Brumwell, Pall Mall, about 1760.
Brunette, Samuel, 13, Castle St., Bloomsbury, 1814; 34, Gloucester St., Queen's Sq., 1825.
Brunion, Henry, Whitecross St., 1775.
Brunner, Gaspard, made a clock at Berne, 1557.
Brunslley, William, at Lilly House, against Strand Bridge, his halfpenny on reverse of token, obverse a clock dial and hands, about 1675.
Bruton, J., dial enameller; died 1863.
Bryan, Richard, admitted C.C. 1696.
 — **Henry**, Strand, 1768.
 — **Jno.**, 3, Shadwell Dock, 1790-94.
 — **Saml.**, 104, Golden Lane, 1790-94.
Bryant, and Son, 47, Threadneedle St., 1781.
 — **John**, Hertford, maker of good clocks, 1790-1829.
Bryer, John (apprenticed to E. J. Dent), 20, Northampton Sq., 1841, afterwards at Barbican; died 1894.
Bryson, Alexander, Edinburgh; "Her Majesty's clockmaker for Scotland," 1830-60.
 — **Jno.**, Dalkeith (apprenticed to Thos. Pringle), 1842.
Buchan, H., 37, Windmill St., Finsbury, 1840-42.
Buck, Edward, exhibited his masterpiece, and was admitted C.C. 1632.
Buckenhill, Edward, C.C. 1687.
Bucket (Bouquet?) subscribed to incorporation of C.C. 1630.
Buckingham, Joshua, Black-moor's Head and Dial, Minorities, 1690-1725; known as a maker of long-case clocks with fine marqueterie cases, 1700. "Stolen from Mr. Richard Parke, in Pey Alley, Fanchurch Street, a gold watch made by Jos. Buckingham" (*Lond. Gaz.*, July 13-16, 1691).
 — **Joseph, Junior**, Minorities, 1740-60.
Bucklie, David, Bridgewater Sq., 1780-94; livery C.C. 1787.
Buckman, John (German), admitted C.C. 1692.
Bucknell, W., 20, Kirby St., 1810.
 — **Wm.**, 10, Parliament St., 1816-23.
Buckner, Richard, C.C. 1701.
Bucknor, Philip, admitted C.C. 1667.
Bucksher, J., 37, Three Colts St., Limehouse, 1817.
Bucquet, Dan., 56, Cannon St., Ratcliff, 1812-20.
Buffet, Jno., Colchester; watch, silver cock, 1735.
Bukenhill, John, admitted C.C. 1672.
Bulet, D., Geneva, about 1750.
Bull, Rainulph, keeper of the "great clock in His Majesty's Palace of Westminster" (see p. 154), 1617.
 — **Edmd.**, Fleet St.; maker, about 1610. See p. 154.
 — **John**, subscribed to incorporation of C.C. 1630; admitted 1632.
 — **John**, admitted C.C. 1637.
 — **Jas.**, 124, Leadenhall St., 1813-18.
Bullby, John, admitted C.C. 1632.
Bullman, Thos., Swan Alley, maker of large marqueterie case clock, twisted pillars, square dial, about 1690.
Bullock, Jas., Furnival's Inn Court, 1790-94.
 — **Widcombe**, Bath; Zephaniah, about 1740; Thos., son of Z., 1765-95; Wm., son of Thos., died 1846,

- succeeded by his nephew Wm. Vokes, who died 1870, aged 59.
- Bult, Jas.**, London; watch, silver case with landscape painted on the back, Schloss collection, about 1780.
- **James, and Co.**, 86, Cheapside, 1815-25.
- Burstead, Robert**, in Holborn, maker of a fine pair-case *repoussé* repeater in leather case; C.C. 1707.
- Bunce, Matthew**, C.C. 1698.
- Bunnett, Wm.**, London; watch, 1780.
- Bunting, William**, Pope's Head Alley, Cornhill; admitted C.C. 1646; maker of a watch in the B.M., on the dial of which is inscribed, "Ioanni Mil-toni, 1631."
- Burchett, John**, admitted C.C. 1731.
- Burckhardt, J. C.**, 14, Northumberland St., Strand, 1816.
- Burdon, Francis**, 3, Hollen St., 1816.
- Burgar, John W.**, 23, Banner St., 1842.
- Burges, Jno.**, London; about 1720.
- **Chas.**, London; watch, pendulum-balance under dial, 1750.
- Burgess, —**, Old Bailey; 1774.
- **Geo.**, 10, Bishopsgate St. Without, 1790; watch by him, 1768.
- **—**, 20, Cheapside; card B.M. 1782.
- **—**, 20, Cheapside; "from T. Wright, watchmaker to the King," watch paper, Ponsonby collection, about 1795.
- **E.**, clock-case maker, 23, Percival St., 1835.
- Burgi, J.** (De Burgi or Burguis), Prague, born 1552, died 1632; a talented mechanician, who in 1602 was appointed clockmaker to Rudolph II. In the Vienna Treasury is a clock with a pendulum attributed to him. There are two oval dials of rock crystal framed with plates of smoky topaz. One dial shows the minutes and hours, and the other the days of the week, as well as the age and phases of the moon. Striking work for the hours is behind one dial, and quarter hour striking mechanism behind the other. The case, in the form of an obelisk, is of agate, adorned by three circlets of garnets.
- Burgis, John**, subscribed to incorporation of C.C. 1630; admitted 1632; maker of an oval calendar watch, in Doyer Museum, about 1625.
- **Thomas**, apprentice to Thomas Knifton, 1654.
- **John**, London, 1680.
- **Elais**, admitted C.C. 1681.
- **Charles Edward**, apprentice to James Clowes, 1685.
- **—**, bracket clock, black bell-top case, back plate nicely engraved and inscribed, "Edward Burgis, Londini, fecit"; about 1720.
- Burgis, George**, London; maker of a tall oak-case clock, 1720-40.
- **William**, London; maker of a watch about 1720.
- Burkham, —**, London; watch about 1720.
- Burnap, Daniel**, maker of brass clock movements at East Windsor, Connecticut, U.S.A., 1780-1800.
- Burleigh, Ninyan**, C.C. 1692.
- Burnet, Thomas**, Bow, 1700.
- Burnett, Richard**, C.C. 1705.
- **Philip**, admitted C.C. 1715.
- **Chas.**, London; watch, 1760.
- **Jno.**, Rosemary Lane, 1822.
- Burns, James**, 76, Lisson Grove, North, 1804-42.
- Burpull, John**, Tooley St., 1750.
- Burrill, Boys Err**, Gt. Sutton St., 1805-20.
- Burrows, James**, 30, Goodge St., 1820-25.
- **E.**, 4, America Terrace, King's Rd., Chelsea, 1835-42.
- Burton, John**, Blue Anchor Alley, liveryman C.C. 1776.
- **William**, London; repeating watch, about 1740; known also as a maker of spring clocks about 1760.
- **Jas.**, Lincoln's Inn Gate, Carey St., 1806-20.
- **Hy.**, London; watch, 1810.
- Burwash, William**, 45, Red Lion St., Clerkenwell, 1790.
- **William**, watch-case maker, 3, Red Lion St., Clerkenwell, 1782-1804.
- **Thomas**, 91, Bishopsgate Without, 1825.
- Buschman, Hans**, Augsburg; astronomical clock by him, Vienna Treasury, about 1600.
- **David**, Augsburg; watch by him, Vienna Treasury, about 1620.
- **John Baptist**, C.C. 1725.
- Bush, James**, admitted C.C. 1729.
- **James**, 104, High St., Shoreditch, 1804-42.
- **James**, 6, Hackney Rd., 1835.
- Bushell, Edward**, London, 1694-1700.
- **Samuel**, London, 1697-1710.
- Bushman, Jno.**; watch, Nelthropp collection, tulip pillars, revolving hour circle, about 1670.
- **John Baptist**, livery C.C. 1786.
- Bushnells, Thos.**, at the Dial in East Smithfield, 1692.
- Butler, John**, admitted C.C. 1724.
- Butter, Joshua**, 36, New Bond St., 1804; 239, Oxford St., 1807.
- Butto, Daniel**, admitted C.C. 1653.

Button and Putley, 204, Boro', 1788 ; card B.M.

Bye, Henry, clockmaker to the City of Paris, 1413.

Byford, William, 23, St. Mary-at-Hill, 1820-35.

Bysse, Edward, maker of curious English watch, at the B.M., about 1610. A Mr. Bispe prohibited from working by C.C. 1632.

Byworth, Thos., 28, King St., Snow Hill; and 12, Bridge St., Lambeth, 1804-42.

Cabrier, Charles, Broad Street, admitted C.C. 1697. In the B.M. is a very thick rounded repeater watch, period 1690; in the centre of the outer case is an enamel medallion; this is surrounded by a circle of *repoussé* work, outside of which the case is nicely pierced. Another example of his work is a silver verge watch, outside case embossed, 1690-1726.

— **Charles**, 79, Broad St., a celebrated maker; admitted C.C. 1726; master, 1757; Pig St., Threadneedle St., in 1759. In 1777 an action was tried in the King's Bench, Cabrier v. Anderson, the defendant having put on five watches the plaintiff's name, without his knowledge or consent. A verdict was given for the plaintiff with £100 damages. Specimens of Cabrier's work are in the Guildhall Museum. One of them is a bell repeating verge watch movement, with nicely wrought and pierced pillars having broad bases and caps, 1726-80.

— **Charles**, Stepney, 1707.

— **John**, admitted C.C. 1730.

— **and Leeky**, 15, Basinghall St., 1781-1804.

— **Favey, and Exchequer**, 14, Wilderness Row, 1794.

— **Favey, and Son**, 1798.

Cachard, Gaspar, 13, Oxendon St., 1820.

Cade, Simon, admitted C.C. 1688.

— **and Robinson**, 153, Leadenhall St., 1822-25.

Caesar, Daniel, admitted C.C. 1703.

Caillate, A., Geneva; about 1725.

Caille, —, London; about 1770.

Caithness, —, New Bond St.; verge watch, about 1750. (See Allan and Caithness).

Calcott, Tobias, admitted C.C. 1664.

Calderwood, Thomas, C.C. 1724.

Callam, Alexander, 74, Lower East Smithfield, C.C. 1790-96.

— **Brothers**, Castle St., Long Acre; celebrated makers of repeating mechanism, 1795-1825.

Calledon, —, London; watch, 1795.

Calliber, John, admitted C.C. 1703.

— **Thomas**, admitted C.C. 1727.

Calson, John, brother C.C. 1647.

Calston, John, admitted C.C. 1653.

Cam, William, C.C. 1686; maker of a lantern clock, inscription, "William Cam, Londini, fecit."

Cambridge, Samuel, C.C. 1697.

Camden, William, Plumtree Court, Shoe Lane; admitted C.C. 1703. Mr. Alfred Bedford has a splendid long-case clock by him. It is still a really excellent timekeeper, and is in a handsome mahogany inlaid case; also maker of a watch reputed to have belonged to Charles XII. of Sweden. It had a silver case, handsomely chased silver dial, silver balance cock, the movement altogether a very fine one, 1703-30.

Camerer, Ropp, and Co., 2, Broad St., Bloomsbury, 1794.

— **A., and Co.**, wooden clockmaker, 2, Broad St., Bloomsbury, 1830-40.

Cameron, D., London; watch, 1825.

Cammerer, M., wooden clockmaker, 13, Brownlow St., Drury Lane, 1840.

Campbell, John, 3 Crowns, Strand, 1691-1701.

— **Alex.**, 393, Strand, 1800-05.

— **W. F.**, 60, Hatton Garden, 1825-35.

Camper, James, 99, Bridge Rd., Lambeth, 1800 40.

Canche, Jacques, London. In the B.M. is a silver alarm watch, in plain silver cases, the outer one perforated, 1680-90.

Cann, John, brother C.C. 1649.

Cannans, John, London; maker of clocks, about 1790.

Cannon, Joseph, London; long Chipendale case clock, day of week, day of month, age of moon, high tide, dead beat esct. centre seconds, about 1790.

Capt, Henry, 56, Frith St., 1840-42.

Card, Edmund, admitted C.C. 1679.

Carduroy, Philip, admitted C.C. 1679.

Carey, George, admitted C.C. 1679.

— **Thomas**, admitted C.C. 1705.

— **George**, 3, Singleton St., 1842.

Carfoot, Chas., 32, Aldersgate St., 1814-25.

Carley, George, 18, Wilderness Row, 1842; afterwards at Ely Place; died 1879.

Carlow, P., maker of a watch for the Duke of Sussex, 1780-1800.

Carnel, C., Strasburg, maker of octagonal pillar timepiece in S.K.M., about 1600.

- Carolan, James**, 69, Red Lion St., Holborn, 1816-25.
- Caron, Peter**, Paris, 1720-60.
— **Peter Auguste**, Paris; son of the foregoing, an eminent watchmaker (see p. 352); born 1732, died 1799.
- Carovagius**, —, Paris, 1550.
- Carpenter, Thos.**, C.C. 1767.
— **William**, 10, St. Martin's Court; hon. freeman, C.C. 1781; 15, Frith St., 1793; 5, Haberdashers' Walk, Hoxton, 1817; 1770-1817.
— **and Son**, 4, Andrew St., Seven Dials, 1785-90.
— **Thomas**, 5, Islington Rd., summoned to take up livery, C.C. 1786. (See T. and R. Carpenter).
— **Thomas and Richard**, watchcase makers, 5, Islington Rd., 1776-1823.
— **F.**, 21, Percival St., 1830.
— **William**, 4, Percival St., 1842.
- Carr, Fred**, 18, Bridge St., Westminster, 1822-25.
- Carre, Daniel**, calendar watch, Nelthropp collection, about 1690.
- Carrington, James**, warden, C.C. 1767; 1760-68.
— **Richd.**, London; watch, 1765.
— **Robert**, 22, Old Bethlem, livery C.C. 1766.
— **Thos.**, Bishopsgate St.; liveryman, C.C. 1766; 1760-1787.
— **Geo.**, livery, C.C. 1786.
— **and Son**, 22, Old Bethlem, 1794.
- Carruthers, Geo.**, Blewett's Buildings, Chancery Lane, 1789-94.
- Carswell, Joseph**, Hastings; maker of long-case clocks, about 1760.
— **J.**, London; watch, 1770.
— **Wm.**, 58, Bishopsgate Within, 1822-25.
- Carte, John**, C.C. 1695; a large thick watch by him, inscribed "John Carte, in Garden Court, in the Middle Temple"; double sets of hour and minute numerals in relief on silver dial; hour hand rotates once in 24 hours, minute hand once in 12 hours.
- Carter, Thomas**, admitted C.C. 1699.
— **Leon Augustus**, C.C. 1726.
— **John**, admitted C.C. 1728.
— **J.**, 14, Bartholomew Close, 1772.
— **William**, Bermondsey St., 1760; 207, Tooley St., 1794.
— **Wm., Junr.**, 1805-26.
— **J.**, 57, Church St., Mile End, 1804-20.
— **John**, son of Wm. Carter, Tooley St.; apprenticed to Boys Err Burrill in 1817, 207, Tooley St., 1829-42; afterwards 61, Cornhill; Lord Mayor, 1857; master C.C. 1856, 1859, 1864; died 1878.
- Carter, William**, watch-case maker 22, Galway St., St. Luke's, 1835.
- Cartier, Jaques**, maker of a watch said to have belonged to Oliver Cromwell 1635; another watch "Cartier, London," about 1680.
- Cartwright, Thomas**, apprenticed to Christopher Gould, 1693. He lived "behind the Exchange"; watch by him in gold *repoussé* case, Schloss collection, inscribed "Thos. Cartwright, watchmaker to the Prince" about 1715; another example in the Guildhall Museum is a watch with crystal cock, jewelled, 1700-30.
— **George**, C.C. 1703-12.
— **N.**, Lombard St., maker of a watch with pierced silver pillars, in Guildhall Museum, about 1720.
— **William**, admitted C.C. 1713.
— **Benj.**, 18, West Smithfield, 1769-72.
— **Ann**, 45, New Bond St., 1783.
- Carver, Isaac**, admitted C.C. 1667.
- Casper, Ellis and Co.**, 29, Finsbury Place, 1804-42.
— **Nathaniel**, 13, Bury St., St. Mary Axe, 1804-42.
- Castang, Philip**, London; watch, Nelthropp collection, 1777.
- Caster, B.** London; watch, silver outer case embossed, about 1770.
- Castlefranc, Peter**, 40, Pall Mall, 1769-83.
- Catchpool, Thos.**, 113, Strand, 1823.
— **Wm.**, Fenchurch St., 1830-35.
- Cater**, —, widow, Moorfields, 1671.
— **J.**, London; about 1780.
- Catherwood, Joseph**, 10, Bunhill Row, 1775-1825.
— **Joseph and William**, 2, New-castle Place, Clerkenwell, 1804-42.
— **G. and R.**, 35, Kirby St., Hatton Garden, 1809-30.
— **Robert**, 35, Kirby St., Hatton Garden, 1835.
- Catsworth, John**, admitted C.C. 1669.
- Cattell, William**, Fleet St.; admitted C.C. 1671; maker of a lantern clock, inscribed "William Cattell, in Fleete Street, Londini," 1671-90.
— **Thomas**, admitted C.C. 1688. "Lost in Chancery Lane, a silver Minute Pendulum Watch, with a green and silver ribbon to the key, the watch made by Cattle, London" (*Lond. Gaz.*, January 19-23, 1692).
- Cathey, Daniel**, admitted C.C. 1731.
- Cattle, John**, fecit 1633, inscription under the alarum disc of a lantern clock.
- Cattlin, James**, 58, Gt. Marylebone St., 1804-42.

Catton, Richd., Leadenhall St. ; duplex watch, about 1820.
Cauch, James, brother C.C. 1692.
Caul and Dennis, 19, Plumtree St., 1816.
Cauldroy, Julien; clockmaker to the Duke of Burgundy, made two watches "without counterweights" by order of the King, 1529.
Cave. See Robinson and Cave.
Cavendish, Richard, livery C.C. 1810.
Cawley, Sam, 115, Bermondsey St., 1842-8.
Cawson, Lancaster; Jas., 1779; Edwd., 1790; Wm., 1817.
Cayne, Andrew, Without Bishopsgate, 1696.
Cellier-Lyons, 1580-90.
Ceson, Londres; on a watch with chain-repeating work, about 1710.
Cetti, Joseph, London; watch, 1800.
Cetti and Co., London; watch, 1830.
Cext, Catharine, apprenticed to James Hubert and his wife, 1730.
Chaband, Hy., 9, Plumtree St., Bloomsbury, 1816-25.
Chadd and Ragsdale, New Bond St., 1775.
Chadwick, John, 36, Cornhill, 1783-1813; 138, Holborn Hill, 1817.
 — **Joshua**, 138, Holborn Hill, 1820-25.
 — **Wm.**, London; watch, 1825.
 — **James**, 18, Great Bath St., Clerkenwell, 1804-42.
Chalfont, Walter, Barnsbury; an inventive watchmaker, 1850-86.
Chalk, James, 36, Bishopsgate St. Within, 1798.
Challoner, William, Skinner St.; liveryman C.C. 1776.
Chalmers, George, 1, Prince's St., Leicester Sq., 1783-88.
Chamberlain, Thomas, Chelmsford. In the B.M. is a watch by him, about 1630; calendar and striking watch, S.K.M., with pierced case of silver gilt, movement signed "T. Chamberlain fecit."
Chamberlaine, Nathaniel, admitted C.C. 1685; master, 1717. "These are to give notice that Nathaniel Chamberlin, Watchmaker (who hath lived several years at Chelmsford, in Essex), for the better accommodation of his friends and customers, hath, at the request of divers of them, taken a Chamber at Mr. John Rust's, in Angel Court, in Lumbard Street, where he doth intend, God willing, to attend the last Fortnight in every Term, for the mending his own Work, and accommodating all persons that

shall have occasion for New" (*Lond. Gaz.*, January 22-25, 1676-77).
Chamberlaine, John, Bury, C.C. 1687; watch by him with day of the month ring, B.M., about 1670; lantern clocks by him, about 1700.
 — **Joseph**, Norwich. "A little Gold Watch made by Joseph Chamberlain, of Norwich, with a plain Dial Plate in a plain black Shagreen Case" (*Lond. Gaz.*, March 15-19, 1687).
 — —, Mark Lane, 1717.
Chambers, James, 3, Squirrels, St. Dunstan's Church, 1690.
 — 56, Cornhill, 1823.
 — **Wm.**, watch finisher, City Rd., 1830; afterwards in partnership with Prior, Ed.
Champion, Guillaume et Isidor, Paris; makers of a watch, in the possession of Mr. Edward Watkins, Manchester, formerly the property of Love-Jones Parry, Carnarvonshire, about 1670.
 — **John**, brother C.C. 1641.
 — **John**, C.C. 1651-76.
 — **John**, London, a watch by him in S.K.M., outer case of shagreen, about 1770; another enamelled case, Schloss collection, about 1780.
 — **Charles**, Paris; about 1770.
Chams, Chas. Sampson, brother C.C. 1692.
Chance, B., London; maker of a watch in the B.M. with the filigree and steel case, 1720.
 — **W. and G.**, London; watch, 1815.
Chancellor, Jno., 81, Bishopsgate Without, 1793.
 — **and Son**, Sackville St., Dublin, well-known clockmakers, 1800-40. In 1811 Jno. Chancellor patented (No. 3487) a musical clock.
Chancey, Jas., London; watch, Nelthropp collection, 1741.
Chandler, Robert, Martin's Court, 1793; 8, Leicester Sq., 1815-25.
Channell, Geo., London; watch, 1795.
Chapman, Simon, C.C. 1675.
 — **Thos.**, Bath; long case musical clock, about 1760.
 — **William**, 6, New Round Court, Strand, 1790-94.
 — **J.**, clock-case maker, 6, Red Lion St., Clerkenwell, 1835.
Chappel, Robert, admitted C.C. 1720; maker of small size sheep's-head arch-dial clocks, "Robert Chappel, London," on disc.
 — **Thomas**, Little Tower St., 1753-63.
Chappuis, Jubilé, Geneva, 1800.
Charle, George, 19, Wilderness Row, 1804-42.
Charlepose —, London; watch, 1705.

- Charleston, Jno.**, London; watch, 1670; Mr. Edwd. Sudell has another of a later date.
- Charlson, P.**, London; watch, h.m., 1764.
- **W.**, London; watch, 1800.
- Charlstrom, William**, Percival St.; livery, C.C. 1810; 1800-38.
- Charlton, John**, one of the first assistants of the C.C.; master, 1640.
- **Matjonat**, apprenticed to G. Graham, 1728.
- **Jas.**, 13, Lisson St. North, 1842.
- Charman, Peter**, 64, Piccadilly, 1816-25.
- Charrington, S.**, died while master, C.C. 1768.
- Chartier, —**, Blois; excelled as a watch-case enameller, 1650-70.
- **Francis**, 1, Angel Court, Throgmorton St., 1765-71.
- Charwell, James**, London; maker of a repeating watch at S.K.M., outer case shagreen piqué, about 1740.
- Chassereau, Robt.**, 4, Beech St., Barbican, 1804-8.
- Chasseur, —**, London; small timepiece with pendulum swinging in front, about 1690. See p. 151.
- Chater, James**, admitted C.C. 1727.
- **James, and Son**, 3, Cherry Tree Court, Aldersgate, 1754-59.
- **Eliezer and James**, 3, Cherry Tree Court, 1760-86; in 1785 Jas. C. patented (No. 1785) a watch guard.
- **Eliezer**, 10, Exchange Alley, Cornhill; master, C.C. 1772; livery, 1776.
- **and Livermore**, 2, Exchange Alley, 1790; 10, Bartholomew Lane, 1794; 20, Tokenhouse Yard, 1800.
- **Richd.**, 14, Cornhill, 1787-1812.
- **Wm.**, 134, Goswell St., 1804-42.
- Chaters, J.**, watch motion manufacturer, 17, Gee St., Goswell St., 1835.
- Chatfield, —**, London; maker of a watch advertised in the *Lond. Gaz.*, 1694.
- Chatham, Wm.**, London; watch, 1782.
- Chatier, Isaac**, 1, Angel Court, Throgmorton St., 1768-88.
- Chaulter**, Hutton, writing in 1773, esteems his work.
- Chauvell, James D.**, Old Broad St., C.C. 1699; clock-watch 1705; also a repeating watch in S.K.M. about 1720.
- Chawner, Thomas**, 34, Ludgate Hill, 1783-88.
- Cheeny, J.**, clockmaker at East Hartford, Connecticut, U.S.A., 1790.
- Cheeseman, Daniel**, C.C. 1699.
- Cheltenham, Michael**, C.C. 1712.
- Cheneviere and Deonna**, Geneva, about 1800.
- **Urbain**, Geneva, 1760.
- Cheney, Wither (Walter?)**, elected master C.C. 1695, but excused on making a contribution to the poor-box.
- Cheril, Edwd.**, 6, Newcastle Place, 1814; **E. & Son**, 1825-30.
- Chesnon, Solomon**, Blois, maker of a very diminutive watch in the B.M., with outer leather case, about 1640; another watch by him described in vol. xi. *Archæological Journal* had no hands; the hours indicated by an escutcheon engraved on a circular plate, which revolved within the hour circle.
- Chesson, Thos.**, Ludgate Hill, 1754-59.
- Chester, Wm.**, 55, Shoreditch, 1804-40.
- Chettle, W.**, 35, Commercial Road, Lambeth, 1830-38.
- Chevalier and Cochet**, Paris, 1790-1805.
- Chilcott, Richard**, C.C. 1690.
- **John**, admitted C.C. 1721.
- Child, Richard**, Fleet Street, admitted C.C. 1632; warden, 1640-43. In 1638 the Blacksmiths' Company sued "Child, the clockmaker," for breach of his oath.
- **Henry**, brother, C.C. 1642; died, while master, 1664. Mr. Eden Dickson has a three train "ting tang" lantern clock by him, inscribed "Henricus Childe, Londini."
- **Ralph**, admitted C.C. 1662.
- **Henry**, Tower Royal, Budge Row, 1677-93, "Lost the 28 instant at Aldermay Church, or between that and the Tower Royal, a plain Gold Pendulum Watch, in a new Fashion Gold Grav'd case, name, Henry Child. It had a Tulip Hand, long freised hours, in the middle of the dial plate engraven with two Birds and Flowers; it was in a Gold Pinned Case" (*Lond. Gaz.*, May 25-29, 1693).
- Chilton, Thos.** London; maker of lantern clock, with arch dial, added about 1700.
- Chismon, Timothy**, summoned to take up livery C.C. 1786; master, 1803.
- Christie, Wm.**, 22, Chancery Lane, 1804-42.
- **Hy.**, 3, Duke St., Manchester Sq., 1842.
- Church, Jno. Thos.**, 19, Oakley St., 1835.
- Churchill, Chas.**, London, centre-seconds watch, h.m. 1787.
- Churchman, Michael**, C.C. 1694.
- Clampson, Richard**, C.C. 1673.

Clare, Henry T., 15, Meredith St., 1804-42.

— **Peter**, a Quaker and watchmaker, well known about 1800. In an account of the village of Hatton, Chester, where he resided, the following reference to him is made:—

There's the cottage of Peter,
That cunning old fox,
Who kept the sun right
By the time of his clocks.

He appears to have been derided for asserting that the sun was wrong and his clocks right, though of course if mean time was desired he would have been doubtless correct in his assertion.

— **Peter**, son of the foregoing; born in Manchester in 1781, was a prominent figure there till he died in 1851.

Clark, Stanford, London, C.C. 1696; watch 1710.

— **Thomas**, admitted C.C. 1720.

— **Jas.**, Morpeth, 1750.

— **Cure**, watch, 1750.

— **Anthony**, Sergeants Inn, Fleet Street, 1763.

— **Edwd.**, 17, Middle Moorfields, 1772.

— **Wm.** 26, Abingdon St., 1730; Bishopsgate St., 1754-74; Paternoster Row, 1775.

— **Edw.**, 56, Cornhill, 1768-75.

— **Lancaster**; **Cornelius**, 1733; **Thos.**, 1767.

— **Robert**, clock and watch-spring maker, Providence Row; 1775-99; watch, Robert Clarke, London, 1780.

— **David**, watch-case maker, 58, Featherstone St., 1789-94.

— **Francis**, 10, Jewin St., 1789-94.

— **Wm.**, 6, King St., Clerkenwell, 1800.

— **Jno.**, 73, Mark Lane, 1794-1823.

— **Thos.**, 9, Goswell St., 1830-40.

— **George**, 24, Bartholomew Terrace, St. Luke's, 1842.

Clarke, George, Whitechapel; admitted C.C. 1632; maker of an eight-day clock, locking plate, striking, handsome brass dial, name on disc, period 1690.

— **William**, admitted C.C. 1634.

— **Humphrey**, Hertford, C.C. 1668; lantern clock by him about 1700.

— **John**, Bristol. In the B.M. is a watch of his make in an outer case of leather piqué, 1630-40.

— **John**, Stanford, C.C. 1696.

— **Thomas**, admitted C.C. 1709.

— **Richard**, C.C. 1720; calendar watch by him, dials back and front,

1740; Richard Clark and Sons, Cheapside, 1815.

Clarke, Geo., Leadenhall St., 1736.

— **Edward**, 9, Holborn, 1768.

— **William**, George Yard, Whitechapel, 1769-72.

— **John Basul**, St. John's Lane, liveryman, C.C. 1776.

— **Jas.**, 52, Rahere St., 1778-1840.

— **Hy.**, warden C.C. 1822-26.

— **Wm.**, 87, Gt. Sutton St., 1804-20.

— **William, and Sons**, 8, Goswell St., 1830-42.

— **William** (Clarke and Sons, Goswell Rd.), died 1875, aged 75.

— **Abraham** (Clarke and Sons, Goswell Rd.), died 1890, aged 79.

— **Daniel** (Clarke and Sons, Goswell Rd.), trustee of the Horological Institute, master C.C. 1892, died 1897, aged 78.

— **Job Guy**, 15, King William St., London Bridge, 1852-6; Sir Edward Clarke, Q.C., Solicitor-General is his son, and when a lad was his assistant.

Claxton, Thomas, admitted C.C. 1646; signed petition against oppression of the Company in 1656; master, 1670.

Clay, William, maker of a watch. Cromwell presented to Col. Bagwell at the siege of Clonmel; also of a clock, inscribed "William Clay, King's Street, Westminster." See p. 311. 1646-70.

— **William**, apprenticed to Jeremy Gregory, 1680; admitted C.C. 1687. A watch by him in the Guildhall Museum; 1687-1700.

— **Thomas**, Chelmsford, a maker of lantern-clocks, about 1650.

— **Charles**, Stockton, Yorkshire. Petitioned Parliament for a patent in respect of a repeating and musical watch or clock; his invention. Mr. Quare produced a watch to answer the same end as Mr. Clay's. The Attorney-General reported in favour of Mr. Clay. The C.C., however, opposed Mr. Clay, and after a tough fight, extending from Feb. 1716 to the latter part of 1717, the patent was not granted.

— **Charles**, Fenchurch St.; watch in crystal case, S.K.M. 1740; another example with chased outer case, about 1750. See p. 245.

Clay, B., London; watch h.m., 1770.

Clayton, Thomas, admitted C.C. 1646; assistant, 1671.

— **Chas.**, London; watches, 1805-20.

Cleeke, Henry, admitted C.C. 1655.

Cleeve, William, brother C.C. 1654.

Cleghorn, Saml., 65, Shoe Lane, 1790.

- Clement, Edward**, C.C. 1670; the inscription "Edward Clement, Exon," on a lantern clock may apply to him.
- **William**, admitted as a brother C.C. 1677; about this time he applied to clocks the anchor escapement invented by Dr. Hooke; master C.C. 1694.
- Clements, Robert**, C.C. 1686.
- **Thos.**, London; maker of bracket clocks, about 1760.
- **Jno.**, London; watch, 1800.
- Clerke, Danl.**, Amsterdam, about 1720.
- **George**, 3, Cherry Tree Court, Aldersgate St.; summoned to take up livery C.C. 1786; 1780-1820.
- **Geo.**, Cherry Tree Court, son of the foregoing; livery C.C. 1810-42.
- **Nathaniel**, London; watch, h.m., 1811.
- **F. W.**, Corahill; died 1885, aged 65.
- Clewes, James**, brother C.C. 1670.
- Clifton, Thomas**, brother C.C. 1651.
- **Thomas**, admitted C.C. 1687.
- Cliverdon, Thomas**, C.C. 1722.
- Closon (or Closson) Peter**, at Holborne Bridge; subscribed to incorporation of C.C. 1630; three years senior warden, 1636-38; maker of lantern clocks; one with fret (Fig. 304) balance escapement, description on fret, "Peter Closon at London, fecit" (see p. 306). On another example is "Peter Closon, at Holborne Bridge," 1626-40.
- Clough, Edward**, Fetter Lane. A watch of his make, with an outer case of leather piqué, in the B.M., is inscribed, "Mayor Johne Miller, his watche," 1630-40. "Stolen a silver watch in a black case, studded about the edges, and one studded flower at the back of it, having a minute motion and the figures of the hours and minutes twice over the plate, made by Edward Clough, near Gray's Inn Gate, in Holborn" (*Lond. Gaz.*, October 6-9, 1690).
- Clowes, John**, admitted C.C. 1672; elected a warden, 1713, but unable to serve through ill-health; maker of a small square bracket-clock, bob pendulum, locking plate, cherub corners, inscribed, "J. Clowes, Londini, fecit."
- **B.**, Liverpool; watch, 1795.
- **O. B.**, Liverpool; watch, 1805.
- **Robt.**, London; watch, 1812.
- Cluer, Obadiah**, admitted C.C. 1709.
- **John**, 22, Skinner St., Clerkenwell, 1835.
- Cluter, William**, admitted C.C. 1709.
- Clutton and Co.**, 48, Rupert St., 1825.
- Clyatt, Samuel**, admitted C.C. 1671, Bell Alley, Coleman St.
- **Abraham**, admitted C.C. 1680.
- **John**, admitted C.C. 1708.
- **William**, admitted C.C. 1709.
- **Samuel**, admitted C.C. 1711.
- Coates, Thos.**, London; watch, 1780.
- Cobb, John**, admitted C.C. 1703.
- Cobham**, —, London; pendulum watch, 1780.
- Cochard, Geo.**, 10, Henrietta St., Covent Garden, 1822-25.
- Cochin, D.**, a celebrated *repoussé* chaser of watch cases, 1660-80.
- Cochran, Saml.**, 291, Wapping, 1780-94.
- **W.**, 266, Regent St., 1825.
- Cockerton, Jonas**, 1751-78.
- Cockford, Matthew**, C.C. 1693.
- Cogdon, Thomas**, Budge Row, chronometer maker, died 1885.
- Coggs, John**, against St. Clement's Church, 1690-1700.
- Cohen, Sam Jacob**, 3, Castle St., Whitechapel, 1815.
- **A. S.**, 9, Newcastle St., Whitechapel, 1820.
- Coker, Ebenezer**, Clerkenwell Close, 1754-69.
- Colambell, Anthony**, Aldersgate St., liveryman, C.C. 1776.
- Colbert, J. G. I.**, Grafton St., 1825.
- Cole, Daniel**, admitted C.C. 1726.
- **Thos.**, Lombard St., 1754-63.
- **John**, C.C. 1729; maker of long-case clocks, 1729-60.
- **I. B.**, 54, Barbican, 1785.
- **Wm.**, Gutter Lane, 1780-1805; pedometer by him, B.M.
- **James Ferguson**, Hans Place, Chelsea; then Park St., Grosvenor Sq.; then 9, Motcombe St., Belgrave Sq.; born 1799, died at Tower House, Bexley Heath, 1880; an able watchmaker and expert springer. He devoted much attention to the lever escapement, of which he devised several forms, and was for some time a vice-president of the Horological Institute.
- **Thomas**, 11, Upper King St., Bloomsbury, an excellent maker of spring clocks; brother of J. F. Cole; died 1864.
- **Richd.**, Cornhill; Ipswich, 1830.
- Coleman, Fr.**, Ipswich; watch, 1720.
- **John**, 115, Newgate St.; hon. freeman of C.C. 1781-83.
- **William**, Arthur St., 1790; 14, Strand, 1794-99.
- **Sampson**, London; watch, 1795.
- **Thomas**, 6, Westmoreland St., St. Mary-le-bone, maker of bracket

- clock, Chippendale style of case, 1810-42; livery C.C. 1813.
- Coleman, Geo.**, London; bracket clock about 1780.
- Coles, M. A.**, 25, Red Lion St., 1790.
- Coley, S.**, London; watch finely enamelled royal blue, Schloss collection, 1795.
- Collett, John**, Royal Hospital Row, Chelsea, 1780-99; maker of mahogany long-case clock, and dial, silver centre.
- Colley, Robt.**, Fleet Street, 1770-85. See also Barkley and Colley
- Collier, Benjamin**, a noted maker; admitted C.C. 1693; Lord Chesham had a gold double-case repeater made by him; 1693-1730.
- **John**, Red Lion St., Clerkenwell, 1770-75.
- **Archibald**, 9, New Bond St., 1790-1830.
- Collingridge, Edmund**, 27, Wilderness Row, livery C.C. 1810; 1793-1830.
- **Thos.**, 136, Aldersgate St., 1838-42.
- Collingwood, Samuel James**, 8, Long Alley, livery C.C. 1786; 1766-94.
- Collins, John**, admitted C.C. 1701.
- **Clement**, admitted C.C. 1705.
- **John**, C.C. 1727, maker of a repeating watch, silver case pierced, silver dial with raised figures.
- **Wm.**, London; watch, 1810.
- **R.**, 52, Strand, 1813.
- **Jas.**, 66, Long Acre, 1822.
- Collinson, Jas.**, London; watch, 1770.
- Collis, Chas.**, London; watch, 1720
- Collomby, Abraham**, Geneva; watch, 1745, Mr. Paul Ditisheim; another with calendar, Messrs. Lambert; another specimen suspended from a long and handsomely enamelled chatelaine, outer case enamelled and studded with diamonds about the same date. At the S.K.M. is a calendar watch about 1750, signed "Abr. Collomby, London."
- **H.**; watch in enamelled case, S.K.M. signed H. Collomby, à Huningen (Huningen Upper Alsace) about 1750.
- Collum, A.**, 74, Lower East Smithfield, 1800.
- Colson (Colston), Richard**, admitted C.C. 1682; maker of a curious 24-day clock at Battle Abbey, Sussex; other examples of his work are a fine watch, Evan Roberts' collection, with pierced contrate wheel, and a watch (inscribed "Colston London") with sun and moon pointers. See p. 143. 1682-1700.
- Combret, Pierre**, Lyons; maker of a calendar watch (see p. 101), 1613; watch in shell-shaped case, S.K.M., about the same period.
- Combs, Joseph**, admitted C.C. 1720.
- Comfort, William**, brother C.C. 1647; signed a petition in 1756.
- Comparr, Ebenezer**, C.C. 1728.
- Compigne, Dav. Winton**; watch, 1770.
- Compton, Walter**, Vere Street, 1692.
- **Adam**, admitted C.C. 1716.
- **Comtesse Louis**, watch-case maker, succeeded Peterman and Debois at Soho, 1810; afterwards at East St., Lamb's Conduit St. See Stram.
- Condén, Robert**, 51, Clerkenwell Close, 1780-85.
- Congreve, William**, Garden Court, Temple; inventor of curious clocks. See p. 296.
- Connell, William**, 22, Myddelton St., 1839; a clever watchmaker who succeeded Ganthony, at 83, Cheapside in 1845; died 1862.
- Connolly, Wm.**, 93, Piccadilly, 1825.
- Conrad and Reiger**, makers of a German octagonal timepiece in S.K.M., about 1590.
- Constable, W. and G.**, Bunhill Row, 1804; 27, Finsbury St., 1807.
- Constantin, —**, Geneva; maker of a heart-shaped watch, S.K.M., about 1740.
- Constantine, Pet.**, 33, Park St., Grosvenor Sq.; card B.M. 1802.
- Cony, John**, brother C.C. 1641.
- Conyers, Richard**, C.C. 1716.
- Cook, Edwd.**, 210, Boro', 1763-72.
- **John**, 22, Cheapside, 1768; 24, Wood St., 1772-75.
- Cook, Joshua**, Blue Anchor Alley, 1793.
- **J.**, watch-cap maker, 5, Robert St., Hoxton, 1835.
- Cooke, Lewis**, petitioner for incorporation of C.C. 1630-32.
- **John**, C.C. 1649-56.
- **John**, admitted C.C. 1662.
- **Robert**, admitted C.C. 1667.
- **William**, admitted C.C. 1681.
- **Thomas**, admitted C.C. 1699.
- **William**, admitted C.C. 1708.
- **John**, admitted C.C. 1712.
- **Joseph**, admitted C.C. 1715.
- **and Gurney**, Foster Lane, 1754-59.
- **John**, 22, Cheapside, 1775.
- **Robert**, 7, Star Alley, Fenchurch St., 1804-10.
- **G. E.**, 5, Jewin St., 1822.
- Cooley, Hy.**, London; long Sheraton case clock about 1805.

- Coombes, Fisher**, admitted C.C. 1728.
 — **Jas.**, 10, Mitchell St., St. Luke's, 1815; 3, Clerkenwell Green, 1825.
- Coope, James**, admitted C.C. 1654.
- Cooper, Hugh**, admitted C.C. 1653.
 — **Edward**, clock-case maker, 91, Sutton St., 1789-94.
 — **Thomas**, 1, King St., Little Tower Hill, 1800.
 — **Edwd.**, London; watch, silver dial, raised figures, about 1730; conversion to rack lever and very large balance about 1805.
 — **and Son**, Derby; watch, 1780.
 — **Wm.**, 8, Old Bailey, 1804.
 — **E.**, Wynyatt St., 1820.
 — **William**, 44, Red Lion St., 1816; 12, Gee St., 1820-42.
 — **Thomas Frederick**, Duncan Place, City Road, and afterwards at 6, Calthorpe St.; a well-known watch manufacturer, who made chiefly for the American market. His son told me the American reputation was obtained through a watch by Cooper, which was used as a Greenwich time standard on a ship when the chronometer had accidentally failed, 1820-62.
- Cope, Peter**, admitted as a brother C.C. 1638.
 — **Chas. Jno.**, 38, Berners St., 1800-30. He was a man of some note, and attested the value of Earnshaw's improvements in 1804.
- Copeland, Alexander**, 113, Leadenhall St., 1800-15; livery, C.C. 1810.
- Copestake, Hy.**, 8, New Bridge St., 1793.
- Coppet, Reg. A.**, watch; on plate over balance, "Geo. Virtue, his watch. From Berne,—1750."
- Corbet, Nathaniel**, maker of a silver watch with studded case, frosted dial plate (*Lon. Gaz.*, Sep. 21-25, 1693).
- Corbett, J.**, 42, Clerkenwell Close, 1825.
 — **T.**, 22, Goswell Terrace, 1835.
- Corbit**, —, 10, Short's Bdgs., Clerkenwell, 1835.
- Cording, Jno.**, 232, Strand, 1812-30.
 — **Chas.**, 118, Minories, 1822-25.
 — **Josh.**, 21, Holborn Hill, 1817-25.
 — **Thomas**, 38, Aldgate, 1822-30.
- Cordon, Richard**, C.C. 1729.
- Cordrey, Thomas**, C.C. 1670.
- Cordwell, Robt.**, C.C. 1646.
- Corghey, John**, Fleet St., 1754-59.
- Corker, D.**, 18, Langley Place, Commercial Rd., 1820-42.
 — **Nath.**, 48, South Moulton St., 1842.
- Cornelius, Jacob**, London; maker of a small diamond-shaped spring time-piece, catgut line, about 1620.
- Cornish, Michael**, C.C. 1661.
- Cornwell, Hy.**, London; watch, 1790; another 1800.
- Corp, Wm.**, 84, Aldersgate St., 1835.
- Corson, Thos.**, 119, High Street, Wapping, 1835-42.
- Cosbey, Robert**, at ye Diall, Rood Lane, C.C. 1653-79.
- Cosse, James**, Cornhill; maker of a verge watch about 1720.
- Cosson, S.**, St. George's East, 1835.
- Coster, Robert**, admitted C.C. 1655.
 — **William**, admitted C.C. 1660.
- Cother, William**, brother C.C. 1668.
- Cotter, Ebenezer**, 13, Goldsmith Ct., Wood St., 1775.
- Cotterel, William**, C.C. 1694.
 — **John**, admitted C.C. 1721.
- Cotterell, Thos.**, 163, Oxford St., 1830.
- Cottle, John**; a lantern clock inscribed, "John Cottle, fecit 1653."
- Cotton, John**, London, C.C. 1695; watch, sun and moon hours (see p. 143), two minute hands; about 1710.
 — **John**, admitted C.C. 1718.
 — **Francis**, 90, Shoreditch, 1822.
 — **R. and T.**, watch-spring makers, 17, President St. East, 1835.
- Cottonbult, John**, C.C. 1729.
- Couche, Charles**, admitted C.C. 1727.
- Coulon, Charles**, Prince's St., Leicester Fields, 1765-68.
- Coulon**, —, Geneva, 1780.
- Coulson, Charles**, Soho, 1769.
 — **Robert**, Whiskin St., 1800-38; livery, C.C. 1810.
 — **Saml.**, 16, North Audley St., 1825.
- Cortauld, Samuel**, Cornhill, opposite Royal Exchange, 1759-63.
 — **P.**, and **Cowles**, 21, Cornhill, 1768-75.
- Costontin, Vincent**, Dieppe; watch, Schloss collection, about 1660.
- Coupé**; watch, enamelled case and dial, about 1640, name plate engraved "James Coupé, London"; underneath on the plate of the watch was inscribed "Marc Grainger."
- Courvoisier, à Paris**; fine ormolu wall clock, belonging to the Hon. Gerald Ponsonby, about 1780. See p. 276.
- Cousens, Thos.**, pendant maker, Bunhill Row, 1793.
 — **R. W.**, 6, York St. East, Commercial Rd., 1835.
- Cousins, Wm.**, 13, Finsbury Place, 1814-18. See Cozens.
 — **and Whitside**, 20, Davies St., 1842.
- Couta, G.**, 12, Blenheim St., Oxford St., 1822-25.
- Coventon, Joshua**, clock-case maker, 60, Red Lion St., Clerkenwell, 1835.

Coventry, R., 21, Queen St., Clerkenwell, 1830.

— **J.**, 8, Paragon Place, New Kent Rd., 1835.

Cowan, James, went from Edinburgh to Paris, and worked under Julien le Roy, 1726; watch, Schloss collection, engraved Jas. Cowan, Edinburgh collection, gold *repoussé* case, about 1755.

Coward, William, C.C. 1681.

— **and Co.**, Cornhill; centre seconds watch, 1780.

— **Wm.**, Lancaster, 1797–1830.

— **and Jefferys**, 149, Fleet St., 1783.

Cowderoy, R. F.; fine watch, Hawkins' collection, about 1750.

Cowdery, Geo., 6, King St., Holborn, 1817.

Cowell, John, 97, Royal Exchange, 1763–1800.

Cowen, H., 3, Sidney's Alley, Leicester Sq., 1800.

Cowie, Jno., 8, Aldermanbury Postern, 1814–18.

Cowles, Geo. and Co., 30, Cornhill, 1780–90.

Cowley, Robt., Chester; member of the Goldsmiths' Company, 1773.

Cowling, Richd., London; watch, 1820.

Cowpe, Edward, brother C.C. 1687.

Cowper, —, London; watch, 1800.

Cowta, Geo., 12, Blenheim St., Oxford St., 1817.

Cox, Thomas, admitted C.C. 1708.

— **Jason**, Long Acre, 1745–60.

— **Samuel**, Long Acre, 1770.

— **Wm.**, 70, Cox Court, Little Britain, 1763–72.

— **James**, 103, Shoe Lane, a clever mechanic, who opened at Spring Gardens a museum of quaint clocks, singing birds, and costly mechanical toys. There were fifty-six pieces in the collection, and the charge for admission was half-a-guinea each person; a regulation providing for the presence of but few visitors at one time was, needless to say, quite unnecessary. In the B.M. is a large centre second elaborate watch by him, suited for the Oriental market, 1765–88. See p. 263. **Cox, Jas., and Son**, 1789–1800.

— **and Watson**, 23, Aldersgate St., 1780–85.

— **Nathaniel**, 140, Goswell Road, 1835–42.

Coxeter, William, C.C. 1654.

— **John**, master C.C. 1661–63.

— **Nicholas**, admitted C.C. 1648; master, 1671, 1677; a celebrated maker; lantern clock, inscription,

"Nicholas Coxeter, neare Goldsmiths' Hall," 1648–80.

Cozens, William, 3, Wilderness Row, 1804–10; 13, Finsbury Place, 1822–25. A prominent man in the trade. Trustee to the W. and C. Benevolent Inst. in 1820.

— **William, and Son**, 10, Bunhill Row, 1822–42.

— **J.**, 10, Bunhill Row, 1835–42; afterwards Cozens, Matthews, and Thorpe.

Craddock, E., 13, Charlotte Terrace, Lambeth, 1835.

Cragg, Jas., Lancaster, 1779.

— **John**, 10, President St. East, 1835; 8, Northampton Sq., 1842.

Craggs, Richard, C.C. 1660.

Craig, Chas., Dublin; cylinder repeating watch, 1780.

Craigingle, John, 90, Park St., Grosvenor Sq., 1839–42.

Cramber, R. P., London; watch, 1810.

Cranbrook, Geo., London; watch, 1770.

Cranfield, Henry, C.C. 1706.

Cranmer, Chas., London; watch, 1800.

Cranze, F. and J., 39, Broad St., 1788 (? See Creuze).

Cratzer, Nicholas, clockmaker to Henry VIII., 1538. See p. 45.

Craven, Thomas, brother C.C. 1688.

Crawley, Thomas, C.C. 1660.

— **J.**, London; watch, 1785.

Crayle, Richard, member of the Blacksmiths' Company, petitioner for incorporation of C.C. (see p. 157); 1610–55.

— **William**, Fleet St.; watch by him, B.M. about 1660. "Lost on the 13 inst., a Gold Watch enamelled, the outside case seal-skin studded with gold; in the backside of it was the history of St. Paul's Conversion, with small character *Saul Saul quid me persequoris?* And on the Dial part was the stoning of Stephen, with Lanskip round about; and in the inside of the back, a Damask Rose exactly enamelled, the Key fastened with a black Ribon. Whoever gives notice of it to Mr. William Crayle, a watchmaker at the Black Boy in the Strand, near the Savoy, shall have 3*l.* reward" (*Lond. Gaz.*, July 13–17, 1676). "Lost on the 22 inst., between St. Andrews Church in Holborn and the further end of Grays Inn Road, a gold watch with the outer case studded, with Mr. William Craile's name engraved on the bottom plate of the said watch. Whoever gives notice of the said watch to Mr. John

- Wheatley, at the 3 Cups in Hatton Street, shall have two guineas reward" (*Lond. Gaz.*, March 20-24, 1690).
- Crayton, Wm.**, London; watch, 1770.
- Creak, William**, Cornhill and Bunhill Row, maker of a verge watch in the Guildhall Museum, 1740-68.
- Creed, Thomas**, brother C.C. 1668.
— **Thomas**, brother C.C. 1674.
- Creede, John**, admitted C.C. 1727.
- Creeke, Henry**. A suit by C.C. for using clockmakers' trade contrary to the statute, compromised by Creeke promising to present to C.C. a new house clock and alarum, and 20s., 1654.
- Cressener, A. M.**, Red Lion Sq.; long inlaid case clock, about 1735.
- Cressner, Robert**, London; maker of lantern bracket clocks; 1690-1730.
- Creswell, Joseph**, corner of Adelphi, Strand, 1775.
- Cribb, William**, 58, Theobald's Rd., 1816-22; 17, Southampton Row, 1829; a chronometer maker who succeeded Birchall and Appleton, formerly Molyneux, 1816-42.
- Cripple, Wm.**, C.C. 1702.
- Cripps, John**, St. Thomas Apostle, 1758-63.
— **John and Francillon**, 43, Friday St., 1769; 24, Norfolk St., Strand, 1793.
- Crisp, Nicholas**, Bow Churchyard, 1754-59.
— **John**, 22, Old Jewry, 1783.
— **William Baker**, Clerkenwell; apprenticed to John Bryer, Northampton Sq., became a chronometer maker of repute, lived for some time at 174, St. John's Street Rd.; died at the Clockmakers' Asylum, New Southgate, 1895, aged 70.
- Croak, Sampson**, admitted C.C. 1668.
- Crocker, James**, C.C. 1716.
— **Wm.**, 34, Gt. Alie St., 1842.
- Croft, John**, admitted C.C. 1665.
— **John**, watch-case maker, 51, Wynyatt St., Clerkenwell, 1835.
- Crofts, Richard**, at the Bear in Foster Lane, right against Goldsmiths' Hall. "A gold watch by Goulon, à Paris, the inside a landscape, a studded case, lost near St. Martin's, to be taken to him if found" (*Lond. Gaz.*, March 25-29, 1675).
- Crolee, Natt**, London; watch, 1775.
- Crooke, Benj.**, Church St., Hackney, 1804-8.
— **Peter**, admitted C.C. 1724.
- Cross, James**, Fetter Lane, liveryman C.C. 1776.
- Cross, Edward**, Blewitt's Buildings, Fetter Lane, 1780-94.
— **John**, 131, Old St., 1804; 35, Cur-sitor St., 1823.
— **John Berryhill**, Jewin St., and 10, Charterhouse Sq., 1822-45; 23, Moorgate St., 1850-52; livery C.C. 1834.
- Crossley, James**, London; maker of lantern clocks, about 1710.
— **Jas.**, King's Ct., Bunhill Row, 1814-18.
— **Richd.**, 14, Giltspur St., 1800-25.
- Crosthwaite, Jno.**, Dublin; a good maker mentioned by Earnshaw, 1760-95.
- Crouch, George**, admitted C.C. 1668.
— **Edward**, admitted C.C. 1691; master, 1719.
— **Robert**, admitted C.C. 1722.
— **John**, Knightsbridge, 1761.
- Croucher, Joseph**, 27, Cornhill, 1825; livery C.C. 1828; Swithin's Lane, 1838.
- Croudhill, Thomas**, 19, Bedford St., Bedford Row, 1790-94.
- Crowford, G.**, London; watch, 1768.
- Crowther, Wm.**, London; watch, 1805.
- Crucifer, Robert**, Sweeting's Alley; admitted C.C. 1689; long-case clock, about 1725.
— **John**, admitted C.C. 1712; maker of sheep's-head brass clock, with arch dial, bought in Holland, and of a similar one at Stirling Castle.
- Cruickshanks, Robert**, 17, Old Jewry, 1772-75.
- Crump, Henry**, admitted C.C. 1667.
- Cruttenden, Thomas**, C.C. 1677.
- Cruze, Francis, and J.**, 59, Broad St., 1759-71.
- Cryton, Wm.** See Crayton.
- Cubley, Thos.**, 54, Crawford St., 1820; Homer St., New Rd., Marylebone, 1830.
- Cue, William**, admitted C.C. 1691.
- Cuendel, Samuel**, 52, Red Lion St., Clerkenwell, 1815.
- Cuff, James**, admitted C.C. 1699.
— **John**, admitted C.C. 1718.
— **Broadhurst**, 204, Regent St., 1823.
— **Jno.**, 138, New Bond St., and 106, Regent St., 1823.
— **Jas.**, 70, St. Paul's Churchyard, 1823.
- Cufford, Francis**, admitted C.C. 1718.
- Culliford, J.**, Bristol, 1680.
- Cullum, A.**, Lower East Smithfield, 1789-94.
- Cumming, Alexander**, born at Edinburgh, about 1732, died at Pentonville, 1814; a celebrated chronometer and clock maker, who first suggested curved teeth for the cylin-

- der escape wheel; author of an excellent treatise on clockwork, which was published in 1766; elected hon. freeman of the C.C. in 1781. He resided at 12, Clifford St. till 1794, then he kept a shop in Fleet St., which after his death was occupied by his nephew, John Grant. Among the fine and curious clocks at Buckingham Palace is one by Alexander Cumming, made for George III., which registers the height of the barometer every day throughout the year. He had £2000 for the clock, and £200 a year for looking after it.
- Cumming, Alex.**, Inverary; watch 1775.
- **John**, 202, Oxford St., 1816-42. See Panchaud and Cumming.
- Cummings, T.**, London; watch, 1802.
- **G.**, London; watch, 1805.
- Cummins, Charles**, 148, Leadenhall St., a maker of chronometers and fine watches. A watch of his manufacture contained an ingenious and original form of fusee stop. A little finger projecting from the smaller end of the fusee was pressed by the chain into the way of a stop on the plate; 1842.
- Cuper, Josiah** (French), Blacksmiths' Company and C.C. 1627-1634.
- Current, Jno.**, London; watch, 1770.
- Curryer, Thos.**, watch-glass maker, 134, Whitecross St., 1835.
- Curson, George**, livery C.C. 1756.
- Curteen**; see Monkhouse.
- Curtis, John**, admitted C.C. 1671.
- **Jas.**, London; watch, 1810.
- Cusin, Charles**, born at Autun, in Burgundy, settled in Geneva, where it is said he introduced watch manufacturing, about 1587. See p. 64.
- **Noel**, Autun, about 1630.
- Custer, J. D.**, Norristown, Pa.; watch marked "Feb. 4, 1843, Patented."
- Cuthbert, Amariah**, C.C. 1694.
- **J.**, 27, Piccadilly, 1790-94.
- Cutlove, John**, Harleston, Norfolk, long-case clock, moving ship, about 1760.
- Cutting, Christopher**, C.C. 1694.
- Dalby, John**, 105, New Bond St., 1783-1804.
- Dalemaige, Jehan**, Paris; clockmaker to the Duchess of Orleans, 1401.
- Dallas, James**, maker of a pocket chronometer for the Duke of Sussex, 1800-20.
- Dallington, William**, London, maker of a watch, pillar case and dial, day of the month circle, about 1680.
- Dalton, James**, watch movement maker, Red Lion St., 1790; 12, Bunhill Row, 1810; 27, Percival St., 1815-20.
- Dalton, Jno.**, 27, Percival St., 1816-22.
- Dammant, Barn.**, Colchester; watch, 1725; lantern clock, square dial, about 1735.
- Dane, Thos.**, 133, Oxford St., 1790-1817; Regent St., N.; 1823.
- **Robert**, 72, Long Acre, 1807.
- Danell, Joseph**, 214, Oxford St., 1822-30.
- Daniel, Stephen**, brother C.C. 1698.
- **Robert**, admitted C.C. 1708.
- **Thomas**, 20, Foster Lane, 1783.
- Daniell, William**, C.C. 1632.
- **Edward**, brother C.C. 1648.
- **Isaac**, admitted C.C. 1648; warden 1674; did not become master.
- Daniels, London**; watch, 1820.
- Dannes, Robert**, Clerkenwell, liveryman C.C. 1776; 1766-80.
- Dapin, Paul**, London. In the B.M. is a repeating watch by him inscribed, "Dr. Samuel Johnson, 1767."
- Darby, Jas.**, London; watch, 1770.
- **John**, 51, Gee St., 1820-42.
- Darbyshire, Wakefield**; centre seconds watch, 1755.
- Dare and Peacock**, 103, Minories, 1770-72.
- Dargent, James**, C.C. 1700-05.
- Dariford, —**, maker of fine *repoussé* gold pair-case watch, gold dial, with calendar, about 1735.
- Darle, Thomas**, London, about 1769.
- Darling, Robert**, Fenchurch St.; Sheriff of London, and knighted in 1766, on the court of C.C. 1766.
- Darrell, Joseph**, 214, Oxford St., 1812-15.
- Darvell, Edwd.**, 64, Watling St., 1775-94.
- Dasher, Frederick**, 10, Pierpoint Row, Islington, 1820-46. To him was apprenticed Egbert Storer.
- Dasypodius, Conrad**, maker of second Strasburg clock (see p. 38), 1571.
- Dauthiau, Paris**; clockmaker to the King of France, 1735-56.
- Davenport, Jas.**, London; watch, 1780.
- **Sam.**, 15, Lime St., 1788.
- David, Louis**, 1550-60 (see p. 73).
- Davidson, J.**, 12, Red Lion St., Clerkenwell, 1814-17.
- **Adam**, 21, Norton St., Fitzroy Sq., 1835; 44, Goswell St., 1842.
- Davie, Joseph**, 201, High Holborn, 1830-42.
- Davies, Timothy**, Clifford St., Broad St., 1783; 15, New Bond St., 1793.
- **Robert**, 85, Gracechurch St., 1788-94.
- **John**, 153, Leadenhall St., 1788.

- Davies, T. and H.**, 39, Brewer St., Golden Sq., 1800.
- **Richard**, 85, New Bond St., 1790-1800.
- **James Callard**, College Place, Camden Rd. In 1840 he patented (No. 8515) a one year clock.
- Davis, Samuel**, at y^e Golden Ball in Lothbury, C.C. 1648-60.
- **Tobias**, admitted C.C. 1653.
- **John**, brother C.C. 1653.
- **Thomas**, admitted C.C. 1674.
- **Benjamin**, admitted C.C. 1678.
- **Jeffry**, admitted C.C. 1690.
- **John**, admitted C.C. 1697.
- **William**, admitted C.C. 1699.
- **George**, admitted C.C. 1720.
- **Thomas**, admitted C.C. 1726.
- **John**, Lamb's Conduit St., 1769.
- **Wm.**, Lancaster, 1761.
- **Wm.**, 124, Newgate St., 1810-23.
- **David**, 28, Bury St., St. Mary Axe, 1830-42.
- **and Bennett**, London; watch, 1795.
- **and Plumley**, 9, Red Lion St., Clerkenwell, 1830.
- **A. and C.**, 118, Houndsditch, 1835.
- Davison, C.**, London; watch, 1820.
- **William**, C.C. 1686.
- Daw, Josh**, 39, Cheapside, 1822.
- Dawes, Wm.**, 131, Upper St., Islington, 1835-42.
- Dawkes, John**, admitted C.C. 1707.
- Dawson, Thomas**, petitioner for incorporation of C.C. 1630; transferred from the Imbroderers Co. to C.C. 1636.
- **Robert**, admitted C.C. 1678.
- **John**, Holborn Bridge, 1763.
- **W.**, London; watch, 1778; another, 1805.
- Day, Isaac**, admitted C.C. 1678.
- **Thomas**, admitted C.C. 1691.
- **Edmund**, admitted C.C. 1692; maker of a bracket clock showing day of the month, and in an oak case veneered with tortoiseshell; 1692-1720.
- **Richd.**, 14, Drury Lane, 1780-94.
- Deacon, Joseph**, 27, Rosoman St., 1814-18.
- **F.**, St. Michael's Alley, 1835.
- **J. C.**, 18, Guildford St., Borough, 1835-42.
- Dealtry, Thomas**, 85, Cornhill, 1783.
- Dean, Deodatus**, 80, Minories, 1793-1801.
- **Thos.**, Old Jewry, 1810; 1. Swithin's Lane, 1820-42.
- Deane, George**, engraver, admitted to C.C. 1671; in 1677 he presented to the Court, through Mr. Henry Jones, a plate with the coat-of-arms.
- Deard, J.**, Corner of Dover St., Piccadilly, 1775.
- Debaufre, Peter**, Church St. Soho; admitted C.C. 1689. The Debaufres were an exceedingly clever French family of horologists, probably driven over here by the revocation of the Edict of Nantes. Peter and Jacob were associated with Facio in the patent he obtained in 1704 for watch jewellery. Peter Debaufre also invented a dead-beat or "club-footed" verge escapement, in which there were two escape wheels, having between them a truncated cone formed of diamond, and cut away at the sides to form an impulse plane acted on by the wheels alternately. Sir Isaac Newton had a watch so made, and spoke favourably of its performance. Sully modified it by using two pallets and one wheel. Under the title of the club-footed verge, each kind was used for watches by Garratt, of Ormskirk, and also by Houghton of the same place. More recently the two-wheel form has been revived for French carriage clocks; 1686-1720.
- **James**, Church St., Soho, admitted C.C. 1712; maker of a large size silver verge watch with day of the month circle; 1712-50.
- De Boufler, Andrew**, London, completed his apprenticeship 1769.
- Debry, Theodore**, a famous French chaser of watch cases, 1590-1630.
- De Caux, Lucas**, Norwich; pendulum watch, 1700.
- De Charmes, Simon** (French), came here through the revocation of the Edict of Nantes; built Grove Hall, Hammersmith, in 1730. His son David lived there. Admitted as a brother C.C. 1691; 1688-1730.
- **David**, admitted C.C. 1692; maker of a plain silver pair-case repeater, rich cock and pillars, "Des Charmes, London," inscribed on enamel dial, 1692-1740.
- Decka, John**, apprenticed to J. W. Addis; admitted C.C. 1757; maker of an eight-day long-case clock mahogany case, inlaid with marqueterie; 1757-90.
- **and Marsh**, Broad Street, Ratcliff Highway, 1790-1800.
- De Coligny, Geneva**; about 1770.
- Dee, William**, Blackfriars, admitted C.C. 1729.
- De Féalins, Jehan**, made a clock for Rouen, 1389, see p. 24.

- De Fontaine, L.**, 18, Wilsted St., Somers Town, 1835.
- De Heck Gerhart**, engraved a watch said to have belonged to James I. See p. 158.
- Delabere**, London; watch, Mr. George Carr Glyn, about 1730.
- De la Corbiere** à Nismes, 1790.
- De Crüe**, Geneva; about 1775.
- De la Fonds**, watch-spring maker, 44, Salisbury Court, Fleet St., 1790.
- **John**, Pinner's Court, Old Broad St., 1790-94.
- De la Fons, James**, Royal Exchange and 66, Threadneedle St., 1790-95.
- **John**, 66, Threadneedle St., 1800; corner of Bartholomew Lane, 1810; 25, St. Swithin's Lane, 1815. Received 30 guineas from the Society of Arts in 1801 for a remontoire. In 1805 he patented (No. 2893) a marine alarum chronometer.
- Delafosse, Samuel** (French), admitted as a brother C.C. 1692.
- Degan, Mathew**; watch, Vienna Treasury, oval brass case, about 1630.
- De la Garde, Gustavus**, 17, Lowther Arcade, 1840-42.
- De Jersey**, Westminster, maker of long-case clocks, about 1810.
- Delacroix**, —, Paris; died 1862.
- Delander, Nathaniel**, admitted as a brother C.C. 1668; 1638-80.
- **John**, case maker, admitted C.C. 1675. "Lost on Monday, August 2, between Fleet Street and the Old Bailey, a gold watch box not finished, in a brass case. Whoever gives notice of it to Mr. John Delander, watch-case maker, over against St. Clement's Church, shall have 10s. reward" (*Lond. Gaz.*, August 5-9, 1675).
- **Daniel**, C.C. 1699. "Lost some time since a large jewel watch, the box and case in one, it winds up on the dial plate and has a steel plate inlaid with gold to make it go faster and slower made by Dan Quare; whoever brings it to Dan Delander, watchmaker within Temple Bar, shall have 10l. reward and no question asked, where all sorts of repeating jewel watches and other are made and sold" (*Lond. Gaz.*, October 5-9, 1714). 1699-1721.
- **John**, Salisbury Court, C.C. 1705.
- **Nathaniel**, Fleet St., near Temple Bar, son of Daniel Delander, admitted C.C. 1721; master, 1747; 1721-59.
- De Landre, Roger**, admitted as a brother C.C. 1641; 1635-50.
- Delandre, James**, admitted as a brother C.C. 1668.
- De la Salle, Thomas**, 42, St. Catherine's, Tower Hill, 1800-18; **De la Salle, Jas. Thos.**, 18, Cannon St., 1810-42; livery C.C. 1826.
- Delaunce, James**, admitted as a brother C.C. 1650.
- De Laundre, Peter**, C.C. 1640.
- Delauney, Peter**, 68, New Bond St., 1822-25.
- Delaversperre, Wm.**, brother C.C. 1650.
- Delolme, N.**, London; watch, 1765.
- **Henry**, 48, Rathbone Place; a good watchmaker who also imported Swiss watches and materials; died 1890, aged 87.
- De Lorme, Paris**, 1720-40; maker of an alarum watch, Evans Roberts collection, with inscription, "From Admiral Lord Nelson to Post Captain Jonas Rose," silver pillars.
- Demaza, George**, 95, Strand, 1825.
- Demelais**, —, London; watch, Dutch style, 1750.
- De Moylym, John**, keeper of the Dulwich College clock in 1553.
- Demster, Roger**, London, about 1790.
- Denham, Geo.**, London; watch, Hawkins' collection, about 1785.
- Denison, Edmund Beckett**, born 1816; elected president of the British Horological Institute, 1868; succeeded his father as baronet, taking the title of Sir Edmund Beckett in 1874; called to the House of Lords under the title of Baron Grimthorpe, 1886; designer of the Westminster clock. See Dent, E. J.
- Denizave**, —, London; watch, 1802.
- Denman, Geo.**, 24, Greek St., Soho, 1820; 39, Newgate St., 1823.
- **John F.**, 13, Cannon Street Rd., Commercial Rd., 1842.
- Denne, John**, 28, Lamb's Conduit St., 1820-23.
- Denning, J.**, 32, Ludgate Hill, 1840.
- Dennis, Francis**, brother C.C. 1673.
- **Peter**, admitted C.C. 1712.
- **D.**, 54, New Bond St., 1816.
- Dennison, Aaron L.**, born at Brunswick, Maine, 1812, died at Birmingham, 1895; a pioneer of American watch-making; in 1850 he started a factory at Roxbury; in 1856 removed to Waltham; subsequently settled in England and devised machinery for making watch-cases at Birmingham.
- Dent, William**, admitted C.C. 1674. He probably worked for Tompion. In 1687, Jeremiah Martin was apprenticed to Tompion and Dent.

- Dent, Robert**, London, C.C. 1681; watch, 1710.
- **and Son**, watch-glass makers, 50, Northampton St., Clerkenwell, 1835.
- **Edward John**, born 1790, died 1853; was apprenticed to a tallow chandler, but disliking that business, induced Richard Rippon, in whose house he lived, to instruct him in making repeating mechanism. He worked as a finisher of repeating watches till 1830, when he joined J. R. Arnold in partnership, at 84, Strand. During the ten years they were together the business was greatly extended, chiefly through the energy and ability of Dent, who, after the partnership expired, established himself at 82, Strand, afterwards removing to No. 61. He also took Desgrange's shop at 33, Cockspur St., and another at 34, Royal Exchange. He married the widow of Richard Rippon, whose sons, Frederick and Richard, took the name of Dent. Dent accepted the stipulation laid down by Denison on behalf of the Government, that the Westminster great clock should be guaranteed to give exact time within a minute a week, and thus secured the contract for making it, on the understanding that it was to be designed by Mr. Denison.
- (Rippon) **Richard**, stepson of E. J. Dent, 33, Cockspur St.; died 1857.
- (Rippon) **Frederick**, stepson of E. J. Dent, 61, Strand; died 1860.
- Denton, Joseph**, Hull; long-case clock by him belonging to Mr. Thos. Boynton.
- **Isaac**, London; about 1790.
- **Wm.**, Poultry, 1816-20.
- Derham, William**, born 1657, died, and buried in Upminster, in 1735; a clergyman and Canon of Windsor, author of "The Artificial Clock-maker," published in 1696; second edition in 1700; third in 1714; fourth and last in 1734. He appears to have been acquainted with and assisted by Hooke, Tompion, and Langley Bradley.
- Dermere, Abraham**, C.C. 1703.
- Deroche, Fras.**, Geneva; enamelled watch, about 1780.
- Derne, Louis**, Nancy; watch, B.M. about 1640.
- Derwood, W. N.**, London; watch, h.m. 1780; another 1805.
- De St. Leu, Daniel**, 17, Cloak Lane, watchmaker to Geo. III., 1763-90.
- Desbois, Jacob**, admitted C.C. 1730.
- Several generations of this family have carried on business in the neighbourhood of Holborn.
- Desbois, Daniel**, apprenticed to John Johnson, whom he succeeded at 9, Gray's Inn Passage; died 1848, aged 75.
- **and Wheeler**, 9, Gray's Inn Passage; a watch by them is in the Guildhall Museum; 1803-35.
- **Daniel**, 9, Gray's Inn Passage, and afterwards 79, High Holborn, died 1885, aged 76.
- Desborough, Christopher**, C.C. 1666.
- Desbrow, Robert**, admitted C.C. 1704.
- Des Granges, Peter**, successor to Recordon, 33, Cockspur St., 1816-42. See Dent.
- Deshais, Matthew**, London; maker of bracket clocks, 1690-1710.
- Desmarais, Peter**, St. Martin's Court, 1794.
- Desmée à Paris**; watch, enamelled dial, Schloss collection, about 1750.
- Desmore, T.**, 11, Clerkenwell Green, 1830.
- Dethau, Matthew**, London; about 1750.
- Dettacher, John**, admitted C.C. 1660.
- Devere, Frederick**, 7, Angel Court, Throgmorton St., 1769-75.
- Deverell, Jno.**, London; watch, 1780.
- De Vick, Henry**. About 1364 he made for Charles V. of France, the first turret clock of which we have reliable record. See p. 28.
- Devis, William**, Fleet St., 1750-65.
- **John**, Gloucester St., Bloomsbury, 1764, afterwards 76, Lamb's Conduit St.; hon. freeman C.C. 1764-83.
- De Welke, Christian**, one of the signatories to the petition of incorporation of C.C. In the eighteenth century an oval watch by him was found in a field near Kettering; 1620-30.
- Dewey, William**, Dutch clockmaker, 59, Broadwall, Blackfriars, 1835.
- Dewin, —**, watch-case maker, 17, Red Lion St., Clerkenwell, 1835.
- Dexter, M.**, London; watch movement in Guildhall Museum, about 1790.
- Dickens, John**, admitted C.C. 1688.
- Dickenson, Rich.**, London; watch, 1710.
- **F. C.**, 1, Upper Ashby St., 1840.
- Dickie, Andrew**, Edinburgh; repeating watch in S.K.M., h.m. 1735.
- **Andrew**, London; long-case clock, 1765.
- Dickinson, Thos.**, Lancaster, 1817.
- Dieu, R. à Paris**; oval watch, no screws, about 1590.

- Dike, Nathaniel**, admitted C.C. 1663.
Dillington, London; watch, Mr. Geo. Carr-Glynn, about 1750.
- Dingley, Robert**, George Yard, Lombard St.; maker of a gold watch, hour-hand only, case with appliqué gold flowers, enamelled; admitted C.C. 1663; 1638-93.
- **Robert**, Bishopsgate St., corner of Great St. Helen's, 1738-40.
- Dingwall and Bailliam**, 9, St. James's St., 1813.
- Dinis, Francis**, engraver; C.C. 1666.
- Dinnott, Robt.**, London; watch, 1795.
- Dixon, Wm.**, 26, Smith St., Clerkenwell, 1835; 32, King's Sq., 1840-42.
- Dobb, William**, brother C.C. 1646.
- Dobell, Ebenezer**, Hastings; patented electric clocks in 1853 (No. 2036).
- Dobree, John**, 3, Charing Cross, 1815; 69, Charlotte St., Oxford St., 1823.
- Dobson, William**, brother C.C. 1670.
- **Arl**, London; maker of a watch with finely enamelled case, in the B.M.; another example is an oval watch, at S.K.M., inscribed, "This watch was a present from y^e King to the Countess of Monteith, 1675"; 1660-80.
- **Arl**, London; watch, 1780.
- **Charles**, Coldbath Fields, liveryman C.C. 1776.
- Dockwray and Norman**, 16, Princes St., Leicester Sq., 1815-19.
- Dod, Richard**, London; maker of long-case clocks, 1695-1720.
- Dodd, G.** wrote a paper on clockmaking in British Manufactures in 1845.
- **G. P. & Son.**, chime clock, about 1855.
- Dodsworth, John**, brother C.C. 1648.
- Dolley, Thos.**, master C.C. 1808.
- Donac**, London; inscription on a watch, gold cases, outer one *repoussé*, h.m. 1807.
- Donaldson, Geo.**, 121, Pall Mall, 1842.
- Dondé, John**, maker of a clock with wheels and balance, 1334.
- Dondi, Joseph**, son of the foregoing, 1350-60.
- Donisthorpe, Geo.**, 85, High St., Birmingham, 1770-1810. Ludlam speaks of him as "the best maker of church clocks I know."
- Donne, Robert**, Lamb's Conduit St., 1763-94.
- **Griffith**, Denton St., Somers Town; apprenticed to John Moore and Son, afterwards at Dent's; died 1884, aged 70.
- Door, George**, admitted C.C. 1671.
- Dorigny, Robert**, clockmaker to the Duke of Orleans, 1397.
- Dorer, Robt.**, Glaris; about 1760.
- Dormer, P.**, London; watch, 1800.
- Dorrell, Francis**, Honeysuckle Court, Grub St.; known as a maker of long-case clocks; C.C. 1702.
- **Francis**, C.C. 1755.
- **William**, Bridgwater Sq., summoned to the livery C.C. 1786; restored Cripplegate Church clock, and made it to strike the hours on the tenor bell in 1797.
- Dorsett, Wm.**, London; watch, 1790.
- Dossett, Gregory**, C.C. 1662.
- Doughty, Thomas**, C.C. 1696.
- **Thos.**, Charles St., Somers Town, invented a compensation pendulum, 1811.
- **Wm. P.**, 10, Great Ormond St., 1816-20.
- Douglas, Walter**, Dollar; long-case clock, four season corners to dial, about 1790.
- **Alex.**, 18, Cross St., Hatton Garden, 1810-18.
- **Jno.**, 52, Red Lion St., 1816.
- Dove Henry**, admitted C.C. 1667.
- Dovey, Richard**, 6, Craven Buildings, Drury Lane, 1765-70.
- Dow, James**, watch-case maker, 15, St. James's Bldgs., Clerkenwell, 1820.
- **William**, watch-case maker, 54, Percival St., 1835.
- **Roger**, Vere St., 1780-85.
- **Robert**, Clerkenwell Close, 1790; 72, Long Lane, 1810-35.
- **Robert**, 96, Upper St., Islington, 1842.
- Downes, Jno.**, C.C. 1725.
- **Joe**, London; watch, h.m. 1774.
- **Robt.**, Clerkenwell Close, 1793.
- **Robt.**, Long Acre, 1798-1818.
- Downing, George**, watch-chain maker, Covent Garden, 1790.
- Downinge, Humfrey**, apprenticed to Mr. Grinkin, free of Barber Surgeons; Blacksmiths' Co. in 1637 applied to have him disfranchised.
- Dowsett, Jeremiah**, C.C. 1708.
- Dowson, John**, 77, Holborn Bridge, and Field Court, Gray's Inn; watch, skeleton movement, h.m. 1764; admitted C.C. 1781.
- **and Peene**, Gray's Inn, 1800.
- Doyle, James**, watch-glass maker, Queen's Sq., Bartholomew Close, 1790.
- Drabble, J.**, London; maker of good bracket clocks, 1710-20.
- Drake, John**, Fleet St.; action by Blacksmiths' Co. to disfranchise him 1633; C.C. fined him £10 for binding his apprentice to the Blacksmiths' Co. 16—; signed a petition to C.C.

1656. Lady Fellows had a round silver watch of his make, with plain outer case, silver dial, and steel hand, now in the B.M.; 1630-59.
- Drake, J.**, London; watch, 1760.
- Draper, John**, admitted C.C. 1703; maker of long-case clocks.
- **W.** (see p. 314).
- **James**, admitted C.C. 1712.
- Draycott, Francis**, C.C. 1678.
- Drew, John**, admitted C.C. 1684.
- **Edward**, admitted C.C. 1692.
- Drills, Jno.**, London, 1780.
- Droeshout, John**, admitted C.C. 1632.
- Drosade, Samuel**, C.C. 1675; watch by him, B.M., about 1680; another, with sun and moon hour indicators, about 1690.
- Droz, Pierre J.**, born at Chaux de Fonds 1721, died at Bienne 1790; made a curious clock for the King of Spain.
- Drury, James**, admitted C.C. 1694, master 1728, clerk 1731; died 1740.
- **John**, admitted C.C. 1720.
- **Dru.**, 32, Strand, 1770-85; card, Ponsonby collection, "Dru; Drury, Goldsmith to Her Majesty, in the Strand, successor to Nath. Jeffreys."
- **Wm.**, 32, Strand, 1800-25.
- **J. F.**, 19, Clerkenwell Green, 1810.
- Dryden, G.**, 30, Little Guilford St., 1835.
- Dryer, Sam.**, London; single-cased watch by him, about 1674, belonging to Mr. Geo. Carr Glyn; another specimen, silver dial, about 1690.
- Dubie**, —, Paris, Court goldsmith, who resided in the Louvre, excelled in fine enamelled watch cases, 1640-50.
- Dubois, Pierre**, Paris; wrote "La Tribune Chronometrique" 1852, and description of the Solytkoff collection 1858.
- Ducastel, Isaac**, admitted C.C. 1703.
- Duchemin, Dr.**, horloger, Rouen, 1570.
- Duchen**. In the B.M. is a watch by him, in a chased case by D. Cochin, 1730.
- Duchène, Ls. & Fils**; watch, in gold egg-shaped case, S.K.M., about 1785.
- Duchesne, Claude**, in Long Acre (of Paris), admitted C.C. 1693; maker of a square full-repeating bracket clock, inscription on back plate: "Claudius du Chesne, in Long Aker." John Wesley's long-case clock by him, arch dial, age of the moon, walnut case, is still preserved in the Wesley Museum, City Rd., and other examples of his work are to be met with; 1693-1720.
- Duck, H.**, London, about 1720.
- Ducker, H.**, 3, South Place, Kennington Lane, 1835-42.
- Duddell, Thos.**, 106, Holborn Hill, 1817-23.
- Dudds, Joseph**, 6, Coleman St., livery C.C. 1766; 1750-72.
- Dudson, Simon**, Tower St., C.C. 1653.
- Ducluet, Jacques**, Blois, 1560-90 (see p. 60).
- Dufalga**, —, Geneva, about 1760.
- Duff, James**, 24, Castle St., Houndsditch, 1840-42.
- Dufour and Ceret**, associated with Voltaire at Ferney 1770. See Lepine.
- **Abraham**; watch, leather case, ornamented with silver, Schloss collection, about 1690.
- —, Paris; curious watch by him, B.M., enamelled portrait over the dial, about 1730.
- Dugard, Thos.**, 34, Red Lion St., Clerkenwell, 1812-19; **Dugard and Simpson**, 1830.
- Dugdale, Richd.**, 12, Broad St., 1800-5; 39, Gt. Marlborough St., 1817.
- Duhamel, Pierre**, Blois. In the Hawkins collection was a small watch by him with enamelled dial, in plain gold case, black shagreen outer case studded with gold, and with gold plate engraved with the monogram of Mary Queen of Scots; a cruciform watch by him, about 1590, Ecole d'Horlogerie, Geneva.
- Du Hamel, Isaac**, known as a maker of bracket clocks, about 1790.
- Duke, John**, Fleet St., maker of a watch in the B.M. (see p. 118), 1650.
- **Joseph** (apprenticed to Markwick), admitted C.C. 1682.
- **Joseph**, admitted C.C. 1728.
- **George**, 8, St. John's St., Clerkenwell, 1835-42.
- Dulin, W. T.**, 10, Cornhill, 1816-30.
- Dumont, Freres**, Besancon; watch, silver cocks, one hand, Schloss collection, 1735.
- Dunbar, Geo.**, London; watch, 1770.
- Dunbill, Josh.**, Prescot; watch, Evan Roberts' collection, h.m. 1820.
- Duncan, Geo.**, London; watch, 1737.
- **Robt.**, London; watch, 1790.
- **Jas.**, 98, Chancery Lane, 1804-10; 44, St. James's St., 1815-25; 33, Old Bond St., 1825-30.
- Duncombe, Richard**, master C.C. 1798.
- Dundas, Jas.**, Edinburgh; apprenticed to Andrew Brown in 1710.
- Dunkerley, Samuel**, 1770.
- Dunkley, John**, 88, Bethnal Green Rd., 1835.
- **Thos.**, 25, Galway St., St. Luke's, 1840-42.

- Dunlop, Andrew**, admitted C.C. 1701; known as a maker of watches and long-case clocks; 1720-40.
- **Conyers**, Spring Gardens, Charing Cross, master of C.C. 1758; 1747-94.
- Dunn, Henry**, admitted C.C. 1677.
- **Anthony**, admitted C.C. 1719.
- **William**, Islington Green, 1835.
- Dunster, Roger**. In the Hawkins collection was a repeating watch by him in delicately pierced and chased gold case, the hands and thumb-piece set with diamonds, in gold outer case chased with allegorical figures, in pierced border chased with scrolls, period about 1700; M. Ern. Roux has a clock watch and repeating movement by him; on the plate and the cock is engraved *Omnia Metitur Tempus Sed Metior Ipsum*.
- Duntnell, Danl.**, 131, Oxford St., 1783.
- Dupin, Paul**, London, maker of a repeating watch in the Guildhall Museum; three cases, inner case engraved and pierced, enclosed in a richly chased one, by Moser; outer case of leather piqué; about 1730.
- Duplock, Chas.**, 129, Borough, 1790-1815; **Duplock and Wiggins**, 1816-30.
- Dupont, à Castres**, maker of a watch in the B.M.; about 1650.
- **Paul**, 27, Ivy Lane, Newgate St.; maker of a watch in Guildhall Museum, case finely worked in *repoussé* by Moser, 1759-72.
- **Chas.**, Cockspur St., 1798-1800.
- Dupous, Edwd.**, London; watch, 1785.
- Duppa, James**, 15, Aldgate Within, 1765-70.
- Durant, Oswald**, petitioner for incorporation of C.C.; admitted as brother in 1632; warden in 1645; did not become master; 1630-45.
- **J. L.**, a watch-case in B.M., finely enamelled by him, about 1690.
- Durdent, Andrew**, C.C. 1662.
- Durley, T.**, 33, Northampton St., Clerkenwell, 1835.
- Durrant, Richd.**, 36, Museum St., 1820-42.
- **Thomas**, near the Broadway, Hammersmith, 1840.
- Durnall, Daniel**, 131, Oxford St., 1780-1805.
- Duseigneur, Pierre**, Geneva; about 1750.
- Dutens, Peter**, Leicester Sq., 1759-65.
- Dutertre, Jean Baptiste**, Paris; inventor of an escapement with two balances, 1724.
- Dutton, William**, apprentice of Graham, and afterwards partner with Mudge, 148, Fleet St.; liveryman C.C. 1766; 1750-94.
- Dutton, Matthew and Thomas**, 148, Fleet St.; Matthew Dutton, livery C.C. 1793; master 1800; 1798-1802; **Matthew Dutton and Son**, 1810-18.
- **Matthew**, 148, Fleet St., 1819-42. He retired to Church St., Stoke Newington, and died about 1843.
- **Guy**, quarter clock, Shandon collection, about 1760.
- Duval, John**, admitted C.C. 1677.
- **Francis and John**, Warnford Court, Throgmorton St., 1755-65.
- Dwerryhouse, Thos.**, Garston; watch, h.m. 1774.
- **John**, 23, Charles St., Berkeley Sq., 1770-1805; hon. freeman C.C. 1781.
- **and Carter**, 30, Charles St., Berkeley Sq., 1810-18; 27, Davies St., 1823.
- **Ogston, and Co.**, 27, Davies St., Berkeley Sq., 1835-42.
- **and Bell**, 131, Mount St., 1840.
- Dyde, Thomas**, London; maker of lantern clocks, about 1670.
- Dyer, Joseph**, Addle St., 1735-40.
- **and Newman**, 9, Lombard St., 1768-72.
- Dyke, —**, Exchange Alley, 1685.
- Dymond, John**, watch-case maker, Windmill Court, Smithfield, 1790.
- Dyson, John**, admitted C.C. 1694.
- Eaden, Richd.**, London; watch, 1800.
- Eady, Wm.**, 14, West St., Smithfield, 1800-18.
- Eagle, John**, admitted C.C. 1690.
- **Nath.**, London; metal-case watch, outer case tortoiseshell, about 1776.
- Eagleton, Christopher**, apprenticed to Charles Halstead, 1683. In the Guildhall Museum is a watch by him; silver case, silver dial, outer case tortoiseshell piqué; 1690-1710.
- Eames and Barnard**, 9, Ave Maria Lane, 1816.
- Earle, Thos.**, admitted C.C. 1720.
- Earles, —** (or Eryles) subscribed to incorporation of C.C. 1630.
- **Jno.**, London, 1700-15.
- Earnshaw, Lawrence**, a clever watchmaker; born at Mottram, near Longendale, Cheshire, where he died in 1767, aged about 60 years. A monument was erected to his memory by public subscription in 1868.
- **Edwd.**, Stockport; an ingenious clock and watchmaker, his shop was said to be a "regular Noah's Ark of mechanical nicknacs"; he was a friend of Jas. Ferguson, 1740-70.

- Earnshaw, Thomas**, 119, High Holborn, born 1749, died 1829. See p. 233.
 — **Thomas, junior**, 87, Fenchurch St., 1825-42.
- East, Jeremy**, admitted as a brother C.C. 1641; maker of a small hexagonal watch, balance cock pinned on, plate inscribed *Jeremie East, Londini*, crystal case, about 1600 (see p. 112); also a small oval watch, plain silver dial, one hand; about 1610.
- **Edward**, Pall Mall, 1632: Fleet St. later. One of the first assistants of C.C.; a very eminent maker (see p. 167); 1610-73.
- **Thomas**, admitted C.C. 1677.
- **Peter**, admitted C.C. 1692.
- **Edward**, apprenticed to R. Lyons and S. Clyatt, admitted C.C. 1696.
- **Edward, junior**, apprenticed to Thomas East; admitted C.C. 1709.
- **Jordon**, son of Edward East; admitted C.C. 1720.
- Eastland, Thomas**, London; maker of repeating watches, about 1750.
- Eastley**, —, 73, High Holborn, card, Hodgkins collection, about 1810.
- Eastwick, Adrian**, 102, Aldersgate St., 1780-85.
- Eave, John**, 8, Oxford St., 1790.
- Eayre, Josh.**, St. Neots; watch, 1750.
- **Thos.**, Kettering. Ludlam in 1758 wrote, "he was for 40 years the first in his profession, chiefly church clocks and bell foundry; he died greatly regretted, 1757."
- Ebben, Wm.**, 37, Islington Green, 1816-42.
- Ebsworth, John**, a good maker. On many full-sized lantern clocks with dolphin frets (originally with balances) is inscribed the address, "At ye Cross Keys in Lothebury." On another clock is the address, "New Cheap Side;" C.C. 1665, master 1697.
- Ebsworth, Christopher**, C.C. 1670.
- Eclipse, Jno.**, London; watch, 1793.
- Eden, William**, admitted C.C. 1726.
- Edgecombe, Thos.**, St. Stephen's, 1780.
- Edington**, —, 24, N. Audley St., 1815.
- **Jno.**, 10, Portland St., 1816; **Edington and Son**, 1830.
- Edkins, James**, 2, High St., Kensington, 1835-42.
- Edley, Wm.**, London; watch, 1748.
- Edlin, John**, admitted C.C. 1687.
- **George**, 6, Aldgate Within, livery C.C. 1810; 1800-13.
- Edlyne, Edgar**, Nevill Alley, Fetter Lane; maker of a verge bracket clock, engraved back; 1690-1710.
- Edmonds and West**, 14, Strand, 1797-1810.
- **Jno.**, 14, Strand, 1820-30.
- Edmunds, Wm.**, London; watch, painted outer case, Schloss collection, about 1785.
- Edwards, Isaac**, admitted C.C. 1719.
- **T.**, London; watch, h.m. 1766.
- **Adam**, London; watch, about 1768.
- **Wm. Jno.**, Coleman St., 1783.
- **William**, 4, Holborn, 1775-83; 109, Cheapside, 1790-94.
- **James**, 180, Fleet St., 1790-94.
- **Wm.**, 26, New Bond St., 1800.
- **Jas.**, 93, Wood St., Cheapside, 1820-25.
- **Robt.**, Great Sutton St., 1820-25.
- **Benj.**, 17, Shoreditch, 1830-42.
- **Jas.**, Commercial Rd., 1814-35.
- **W., and Son**, 2, Theberton St., Islington, 1835-42.
- **A.**, watch-cap maker, 14, Great Sutton St., 1835.
- **Jas.**, 43, Cornhill, 1849.
- Effington, John**, admitted C.C. 1702.
- Egleton, Christopher**, apprenticed to Charles Halstead in 1683, admitted C.C. 1696.
- Ehrhardt, Wm.**, a clever horologist; founded a watch factory on advanced principles at Birmingham; born 1831, died 1897.
- Eiffe, James Sweetman**, born 1800, died 1880; a clever chronometer maker, who for some time carried on business at 48, Lombard St. He invented a compensation balance very similar to that patented by Molyneux.
- Eldridge, John**, admitted C.C. 1677.
- Eley, Jas.**, 11, Fenchurch St., 1780-85.
- Elfin, Benjamin**, admitted C.C. 1674.
- Eliason, Daniel**, 18, Leman St., Goodman Fields, 1785-90.
- Elchinger, Hans Conrad**, Amsterdam; watch, the dial engraved with representation of a pedlar crossing a brook, 1620.
- Elisha, Caleb**, 3, Marylebone St., Golden Sq., 1820; 175, Piccadilly, 1835; 8, New Bond St., 1842.
- Elkins, William**, admitted C.C. 1709.
- Ellerton, Robt.**, Lancaster, 1721.
- Elley, Jas.**, 52, Rathbone Place, 1816.
- Ellicott, John**, All Hallows, London Wall, 1696-1733.
- **John**, 17, Sweeting's Alley, Cornhill, an eminent maker (see p. 210); born 1706, died 1772.
- **John, and Sons**, 17, Sweeting's Rents, 1769-88.
- **Edward, and Sons**. Edward

- Ellicott, master C.C. 1834; 17, Sweeting's Alley, Cornhill, 1783-1810.
- Ellicott and Taylor**, Sweeting's Alley, Cornhill, 1811-30.
- **and Smith**, 17, Sweeting's Alley, Cornhill, 1830; 27, Lombard St., 1839-42.
- Elliott, Henry**, brother C.C. 1688.
- **Thos.**, Greenwich; long-case clock, about 1740.
- **Josh.**, Berkhamstead; musical clock, about 1750.
- **Wm.**, London; watch, h.m. 1787.
- **Jas.**, Oxford St., 1780-1800.
- **and Son**, 119, Oxford St., 1805.
- **John Moseley**, Aylesbury St., Clerkenwell; patented a repeater in 1804 (No. 2759) (see p. 356).
- Ellis, James**, admitted C.C. 1667.
- **Thomas**, admitted C.C. 1682.
- **Paul**, brother C.C. 1682.
- **John**, admitted C.C. 1726.
- **Richard**, Westminster, maker of bracket quarter clocks, about 1790.
- **and Collins**, 52, Strand, 1804.
- **Henry**, Exeter, 1810.
- **David**, 2, John St., Oxford Rd., 1817.
- **T.**, London; watch, 1838.
- **Michael**, 18, Bevis Marks, 1842.
- Elliston, Robert**, Orange St., 1770; 12, Charles St., Covent Garden, 1790-1820. His son, Robt. Wm. Elliston, the celebrated actor, was born at Orange St., April 7, 1774.
- Ellwood, John**, admitted C.C. 1702; maker of long marqueterie case-clock, square dial, 1702-25.
- Elmes, William**, brother C.C. 1667.
- Elson, David**, brother C.C. 1646.
- Elton, John**, admitted C.C. 1675.
- Elwood, Martin**, admitted as a brother C.C. 1687; a watch by him in the Guildhall Museum, silver dial, curious tortoiseshell case inlaid with silver, 1680-1700.
- Ely, James**, 8, Soho Sq., 1825.
- Emanuel, Joel**, Bevis Marks, 1812-17.
- **Lewis, and Son**, 36, Swan St., Minories, 1820-42.
- **Brothers**, 1, Bevis Marks, 1830.
- Emery, Josiah**; an eminent Swiss watchmaker, who settled here and carried on business at 33, Cockspur St., Charing Cross; hon. freeman C.C. 1781 (see p. 350); an eight-day watch by him with extra wheel in the train, about 1780; another example is a watch in the Guildhall Museum, ruby cylinder, helical balance spring, compensation curb; 1770-1805 (succeeded by Recordon).
- Enderlin**, —, Bale, maker of Equation clocks (see p. 253), 1720-40.
- Engall, Abraham**, admitted as a brother C.C. 1648.
- Ennis, Edward**, admitted C.C. 1658.
- Enys, Edward**, admitted C.C. 1684.
- Erbury, Henry**, admitted C.C. 1650-56.
- Erhardt, J. C.**, maker of a watch, B.M. about 1700.
- Ericke, Robert**, admitted C.C. 1719.
- **William**, admitted C.C. 1730; watch by him with extra wheel in the train, the minute hand travelling once round the dial in two hours.
- Errington, F.**, Saville Row, Walworth, 1835.
- Eryles**. See Earles.
- Essex, Robt.**, 223, Strand, 1823.
- Ester (Esther) Henry** (French): a watch resembling a pelican, S.K.M.; another (B.M.) in the shape of a tulip; another example of his work is a watch in the Vienna Treasury, the case is circular, worked à jour representing foliage and enamelled in different colours, on the dial of enamelled gold are the signs of the zodiac, 1630-60.
- Esterbrook**, —, Theobalds Rd., 1730-80.
- Eston, Edward**, admitted C.C. 1708.
- Etherington, George**, Fleet St., C.C. 1684; master, 1709; maker of long-case clocks. Mr. Thos. Boynton has a fine specimen, see p. 318.
- “A Gold Minute Watch with a green Shagreen case, with gold studs, made by George Etherington” (*Lond. Gaz.*, Dec. 25, 1689).
- “George Etherington, Watchmaker, is Removed from the Dial in Fleet St. to the Dial over against the New Church in the Strand London, where all sorts of Jewel Watches and others are made and sold.” *Lond. Gaz.*, October 5-9, 1714.
- Etty, Marmaduke**, C.C. 1716.
- Evans, Thomas**, admitted C.C. 1673.
- **Henry**, admitted C.C. 1682.
- **Thomas**, admitted C.C. 1718.
- **Thomas**, Royal Exchange; C.C. 1720; watch, 1749.
- **William**, 23, Aldgate Without, 1775.
- **James and Son**, 7, Sweeting's Alley, 1770-1800. See Higgs and Evans.
- **David**. See Higgs and Evans.
- Eve, John**, 17, New North St., Red Lion Sq., 1842.
- Everell, John**, “by ye new church in ye Strand;” maker of a verge watch,

- square pillars, outer case of tortoise-shell, 1730-60.
- Everett, Jno.**, London; watch, 1770.
- Evill**. Two or three generations of clockmakers in Bath. James Evill, about 1750. William Evill, Union St., about 1800.
- Ewer**. See Eyre.
- Exchagnet, Louis**, Wilderness Row, 1790.
- Exelby, James**, St. John's Lane; C.C. 1718; known as a maker of long-case clocks; 1718-30.
- **George**, watch jeweller, 6, Red Lion St., Clerkenwell, 1790-94.
- Eyre (Ewer) John**, admitted C.C. 1703; maker of long-case and bracket chime clocks, 1703-30.
- Eyston, Edward**, admitted C.C. 1659.
- Facio, Nicholas**, born at Basle, 1664, died in Worcester, 1753; introduced watch jewellery (patent No. 371, May, 1704). See p. 351.
- Fage, Edward**, admitted C.C. 1667.
- Faircloth, Thos.**, C.C. 1660.
- Fairclough, Edwd.**, Liverpool; watch, about 1795.
- Fairer, Joseph**, Bishopsgate, 1850; he seems to have been but a short time in business, but his name was on several clocks for public companies.
- Fairey, John**, 22, Ratcliff Highway, 1810-42.
- **Richard**, 150, Tooley St., 1814-42.
- **Richard, junior**, 68, High St., Borough, 1835.
- Falkner, Edwd.**, London; quarter clock, Mr. Eden Dickson, about 1750.
- **Wm. W.**, Shagreen case maker. Shoe Lane, 1793.
- **John**, 153, Newman St., Oxford St., 1824-28.
- Falks, Robert**, C.C. 1720-25.
- Farewell, John**, C.C. 1695-1700.
- Farmer, Leonard**. Received £37 in 1617 for a clock and chimes and "twoe dyalls, and for a barrel and pricking thereof," from the churchwardens of St. Margaret's, Westminster.
- **Thomas**, admitted C.C. 1647.
- **Thomas**, admitted C.C. 1653. In the St. Margaret's Westminster, churchwardens' accounts for 1658 appears "Item to Mr. Farmer for making of the new diall on the westward of the church, as by his bill appeareth 14l. 10s.;" also, "Item to Mr. Farmer for a new diall at the west end of the church on the churchyard side, 7l.;" 1653-60.
- **Richard**, admitted C.C. 1684.
- Farmer, Thomas**, admitted C.C. 1689.
- **William**, 20, Hanover St., 1800.
- **G. W.**, 32, Tavistock St., 1822-30.
- Farquhar, W.**, 6, Upper East Smithfield, 1835-42.
- Farquharson, Geo.**, 66, Strand, 1775; 421, Strand, 1780; 8, Exchange Alley, 1793.
- Farran, Robt.**, watch-chain maker, 9, Moorfields, 1780-83.
- Farrend, V.**, 48, Cheapside, 1825.
- Farrer, William**, Pontefract, one-day long-case clocks, about 1730.
- Farrett, Richard**, admitted C.C. 1670.
- Fatton, Frederick Louis**, New Broad St. In 1822 he patented an astronomical clock (No. 4645).
- Faulkner, Edward**, master, C.C. 1734; 1710-35.
- **William**, 1770-88; livery C.C. 1787.
- Faux, John**, Worship St., Moorfields, 1780-85.
- Favey, Francis**, 12, Wilderness Row, 1785-90.
- **and Son**, 5, Corporation Row, 1804.
- Favre, Henricque**, Londres; bracket-clock, about 1730.
- London; watch about 1750.
- **Henry**, 27, Pall Mall, 1800-18.
- Fawcett, Jno.**, apprenticed to J. Bartholomew, Clerkenwell, settled in Richmond, Yorks., a good maker; died 1869, aged 88.
- Fayner, Jas.**, clock wheel cutter, 35, White Lion St., Pentonville, 1810.
- Fayrer, Thos.**; Lancaster, 1744.
- Fazakerley, Thos.**, "at the Dial and Crown in St. John's St., near Hick's Hall, London," card Hodgkin collection about 1780.
- Fazy, John**, 7, Red Lion Court, Fleet St., 1780-85.
- Fealins**. (See De Fealins).
- Fearn, John Geo.**, 114, Strand, 1800; 73, Strand, 1813; 18, Cornhill, 1814; 22, Regent St., 1840; among the effects of Charles Kean sold at his decease, was a gold duplex watch, gold dial with raised polished numerals, serpent hands, hall mark 1816, movement inscribed J. G. Fearn, 73, Strand.
- Fearon, Daniel**, Fetter Lane, liveryman, C.C. 1776.
- Febuce**. (See Le Febuce).
- Feilder, Thomas**, admitted C.C. 1689; master, 1715; 1689-1716.
- Fell, William**, admitted C.C. 1705.
- **John**, admitted C.C. 1727.
- **Jas.**, Lancaster, 1767.
- Felmore, E.**, London; watch, 1778.
- Felter, Nicholas**, admitted C.C. 1632.
- **Thomas**, admitted C.C. 1709.

- Fenn, Robert**, admitted C.C. 1689.
- **Daniel and Samuel**, 105, Newgate St.; D. Fenn, master C.C. 1766; 1760–1804.
- **Samuel, and Sons**, 105, Newgate St.; S. Fenn, master C.C. 1793; 1806–15.
- **Joseph**, 105, Newgate St., master C.C. 1842 and 1863; 1830 till 1868, when the shop, which projected by the railings of Christ's Hospital, was pulled down to widen the thoroughfare.
- Fennel, Richard**, Kensington, maker of bracket clock, arch, dial, bell-top shape with handle, also a long mahogany case-clock, inscribed "R. Fennel, Kensington;" admitted C.C. 1679; 1676–1700.
- Fenton, John**, admitted C.C. 1662.
- **Wm.**, London; watch h.m. 1784.
- **Sam.**, 4, Gower Place, Euston Sq., 1840.
- Ferguson, James**, born 1710, died, and buried in Marylebone churchyard, 1776; astronomer and mechanician. (See p. 246.)
- Ferment, John**, admitted C.C. 1679. Wood mentions a square pedestal watch by Ferment, 1670–90.
- **Paul**, London; watch about 1745.
- Ferron, John**, London, admitted C.C. 1692. In the Hawkins collection was a magnificent repeater by him, gold dial set with small brilliants, pierced and engraved gold case, second case chased with flowers and arabesques, inlaid with plaques of moss agate, and set with numerous brilliants and coloured stones, shark skin outer case.
- **Lewis**, London; maker of a long marqueterie case clock, pull chime quarters, angel and crown corners, about 1720.
- Fetters, Henry**, East Smithfield; free Blacksmiths', 1630; admitted C.C. 1653.
- Fever, Hy.**, Pall Mall; watch, about 1750. (See Favre).
- Fidgett, William**, C.C. 1789, Dockhead, Bermondsey; and 3, Bell Court, Fenchurch St., 1780–1825.
- Fidley, Geo.** See Findley.
- Field, Wm.**, London, C.C. 1733; watch, 1750.
- **Daniel**, 21, Red Lion St., Clerkenwell, 1798.
- **Geo.**, London; watch, 1800.
- Fielder, Thomas**, London, about 1715.
- Filton, Charles**, admitted C.C. 1674.
- Finch, John**, admitted C.C. 1675; master 1706. "A gold minute pendulum watch, with a chain and a large gold engraved case, made by John Finch, of London, about £20 value, was put to be mended to a watchmaker in Bristol who is since gone" (*Lond. Gaz.*, June 16–19, 1706).
- Field, Thomas**, brother C.C. 1676–1706.
- **William**, Kingston, admitted C.C. 1691; maker of long-case clocks, 1691–1720.
- **Robert**, admitted C.C. 1691.
- **Simon**, admitted C.C. 1706.
- Finchett, Arnold**, Cheapside; a water clock by him in B.M., 1735.
- Findley, J.**, 5, Duke St., 1820.
- **Geo.**, 43, Ratcliff Highway, 1835–42.
- Finé, Oronce**, Paris; professor of mathematics and designer of clocks, 1540–60.
- Finelly, —**, Aix; watch in the form of a pectoral cross, about 1560.
- Finer, John**, 5, Hatton Garden, 1791–1800.
- **Thomas and Nowland**, 5, Hatton Garden, 1800–5; 48, High Holborn, 1808–23.
- **Horatio**, 48, High Holborn, 1840–42.
- Finlow, Zach**, London, 1780.
- Finnie, Henry**, admitted C.C. 1728.
- Fish, Henry**, 4, Sweeting's Alley, Royal Exchange; black bell-top case bracket clock, inscription on arch, "Henry Fish, Royall Exchange," probably son of Henry Poisson; 1730–75.
- **John**, apprenticed to his mother, Mary, wife of William Fish; admitted C.C. 1766.
- **C. H.**, 13, Mill St., Hanover Sq., 1830–35.
- Fisher, Rebeckah**, bound apprentice for seven years to George Taylor and Lucy, his wife, 1715.
- **Ebenezer**, C.C. 1725.
- **Joseph**, 2, Leicester Sq., 1783–1815.
- **Dan.**, Bunhill Row, 1769–72.
- **Daniel, and Son**, 9, Worship St., Finsbury, 1790–1804.
- **Isaac**, 3, Cockspur St., 1804–23.
- **—**, 97, Portland Place, Edgware Rd.; bracket clock, about 1810.
- Fishwater, John**, C.C. 1726.
- Fitree, Samuel**, Whitecross St., 1790.
- Fitter, John**, Battersea, admitted C.C. 1685; splendid watch by him, 1665 (see p. 141). Wood mentions a gold enamelled watch by Fitter, 1660–1700.
- **Thomazon**, 37, St. John's Sq., Clerkenwell, 1759–83.

- Flack, G.**, 9, Princess St., Drury Lane, 1820.
- Fladgate and Wilder**, Conduit St., Hanover Sq., 1765.
- **John**, Conduit St., Hanover Sq.; hon. freeman, C.C. 1781. In the B.M. is a small clock by him, brass dial with arch cherub corners. Mr. Thos. Boynton has a bracket clock in ebonized case by him; 1760-83. (See Simpson H.)
- Flaig, Robert, and Co.**, wooden clock-maker, 39, Kingsland Road, 1840.
- Flameyer, B.**, London; small watch, silver pair cases, outer one curiously engraved, 1765.
- Flashman, George**, 18, Fleet St., 1790-1813.
- Fleetwood, Robert**, Featherstone Buildings, Holborn, in 1760; 13, Abchurch Lane, 1776; liveryman C.C. 1760-90.
- **John**, Dorrington St., 1790-94.
- Fleming, Andrew**, C.C. 1725.
- **David**, 36, Shadwell High St., 1817.
- Flemming, Wm.**, 105, Whitechapel, 1815-19.
- Fletcher, Daniel**, admitted C.C. 1646.
- **Thomas**, in St. Martin's; admitted C.C. 1676; threatened with prosecution by C.C. for undue taking of apprentices, 1682.
- **Edward**, admitted C.C. 1697.
- **Charles**, 29, Marylebone St., Piccadilly, 1840-42.
- **M.**, 25, Charlotte St., Fitzroy Square, 1835.
- **John**. Originally a Lancashire pinion maker, he started in London as a chronometer escapement maker, and afterwards manufactured unsprung marine chronometers for the trade at 14, Chapel St., Liverpool Rd. During a period of depression in the chronometer trade, Fletcher bought the business of Dwerrihouse in Davies St., Berkeley Sq., which he carried on for a year or two. But as a West End shopkeeper he was quite out of his element, and in looking out for a more congenial sphere of action, he learnt that Eiffe, who had made for himself a name as a chronometer maker in Lombard Street, was anxious to retire; and Fletcher made arrangements to take over Eiffe's shop. In Lombard St. Fletcher was most successful. He learnt springing from William Cribb, and settled down as a chronometer maker, springing and adjusting his own work. When the lease of the premises in Lombard St. expired, he bought the business of Cummins, at 148, Leadenhall St., and having by this time also established a reputation of his own, he did a very flourishing business there for many years. As age crept on him he gave up the more active superintendence of his business, which declined; and after removing from 148, which was pulled down, to 99, Leadenhall St., and again to Billiter St., he finally retired about 1880, and died in 1882, aged 80.
- Fleurian, Esaye**, clock in marqueterie case, Queen Anne style, about 1705.
- Flookhart, Andrew**, 5, King St., Covent Garden, 1814-35.
- Floden, William**, 20, Skinner St., and Coburg St., Clerkenwell, 1835.
- Flood, Humphrey**, received £220 for a clock "covered with gold and set with rubies and diamonds, delivered to his Majesty's use" (James I.), 1607-17.
- Flook, J.**, London, bracket clocks, about 1750.
- Floward, Wm.**, London; watch, 1790.
- Flower**, —, London; watch, about 1700 (see p. 128).
- **Thomas**, admitted C.C. 1730; pendulum watch, Schloss collection, fine dial, about 1740.
- Flowers, Edward**, Rolls Buildings, Fetter Lane; watch, beautiful outer case, set with pearls, h.m., 1783, 1769-84.
- Fly, Joseph**, London; calendar watch, Schloss collection, about 1770; another about 1780.
- Fogg, Hugh**, near Exeter Change, Strand, 1765-70.
- Foilman, John**, watch-glass maker, George St., St. Martin's Lane, 1790.
- Foissey, Jules**, Bologne, died 1892; aged 57.
- Fole, Robert**, admitted C.C. 1667.
- Folkard, Jas.**, 124, Great Surrey St., 1823.
- Foote, William**, admitted C.C. 1726.
- Forbes, Wm.**, London; watch, 1805; Hide Market, Leadenhall, 1838.
- **John**, 122, Leadenhall St., 1835-40.
- Ford, William**, admitted C.C. 1770.
- **Thomas**, admitted C.C. 1724.
- , —, 31, Gracechurch St., 1820.
- **and Simmons**, 16, King St., Seven Dials, 1842.
- Fordham, Thomas**, admitted C.C. 1689; fine long case clock by Thos. Fordham, Braintree, Essex, about 1730.
- Foreman, Francis**, St. Paul's Gate,

- petitioner to Charles I. for incorporation of C.C., and one of the first assistants of C.C.; maker of a lantern clock; 1629-49.
- Foreman, Michael**, livery C.C. 1810.
- Forester, J.**, Union St., Bishopsgate, card Hodgkin collection about 1810.
- Forfaict, N.**, Paris, maker of an octagonal watch presented to John Knox by Mary Queen of Scots, which is now in the B.M., 1550-60.
- Forford, Augustin**, Sedan, maker of an oval watch, about 1650.
- Forgat, —**. "A round brass clock, the Box well gilt and pearced all over, in a leather Case, the name *Forgat*" (*Lond. Gaz.*, March 29, April 1, 1680).
- Forrest, Joseph**, admitted C.C. 1692.
- **John**, 29, Myddelton St.; died 1871.
- Forster, William**, admitted C.C. 1681.
- **Clement**, admitted C.C. 1682.
- **John**, apprenticed to D. Quare; admitted C.C. 1689.
- **John**, admitted C.C. 1726.
- Forsyth, James**, Albion Buildings, Bartholomew Close, 1790.
- Forte, John**, admitted C.C. 1672.
- Fortfart, Isaac**, Sedan, 1585.
- Foss (Fox?) Thomas**, 131, Strand, maker of 8-bell chime clock, brass dial, with strike-silent, silvered circles at top, 1780-95.
- Foster, Joseph**, Exchange Alley, admitted C.C. 1691.
- **S.**, Birchin Lane; a watch by him, bloodstone and gold case, Hawkins collection, about 1780.
- **Isaac**, 1, Bartlett Passage, 1788.
- **J. Benj.**, 22, Cursitor St., 1817.
- Foulcon, Benj.**, London; about 1780.
- Fowde, John**, admitted C.C. 1653.
- Fowkes, Gabriel**, Dartford, maker of long Oriental lacquer case clock, with picture in centre of door, arch dial, engraved silver centre, flower and scroll corners, about 1750; also a bracket clock about 1780.
- Fowlds, Andrew**, 9, St. John's Sq., 1790-94.
- Fowler, Wm.**, London; watch, 1780.
- **Thos.**, London; watch, 1782.
- Fowles, Allen**, Kilmarnock, said to have made a watch for Robert Burns in 1771.
- Fowll, Edward**, admitted C.C. 1670.
- Fox, Charles**, admitted C.C. 1662.
- **Mordecai**, admitted C.C. 1689.
- **Isaac**, 39, Minorities, 1772; 7, Great Prescot St., 1782-94.
- **and Son**, 7, Magdalen Buildings, Prescot St., 1788.
- Fox, Thomas**, 131, Strand, 1790. (See Foss.)
- Frail, Thos.**, 92, Edgware Rd., 1814-18.
- Framborough, Edward**, admitted C.C. 1689.
- Francis, Bulmer**, admitted C.C. 1731.
- **William**, 15, King St., Clerkenwell, livery C.C. 1810; 1805-40.
- Franck, Thos.**; crystal cased watch about 1580 (see p. 104).
- Franklin, William**, C.C. 1712.
- **William**, admitted C.C. 1731.
- **William**, watch shagreen-case maker, Shoe Lane, 1790; livery C.C. 1810.
- Frazer, —**, Bond St., 1788.
- Frearson, John**, admitted C.C. 1689.
- Freeman, Stafford**, C.C. 1664.
- **John**, admitted C.C. 1646; assistant, 1671; died, 1680.
- **Thomas**, admitted C.C. 1698.
- **James**, admitted C.C. 1719.
- **Jas**, St. Botolph, Bishopsgate. In 1769 he patented a stop watch (No. 946).
- **Nathaniel**, 26, Upper King St., Bloomsbury, 1840-42.
- French, John**, 21, Tavistock St., 1783-88; Mile End, 1800.
- **James**, 17, Castle St., Holborn, and 21, Tavistock St., 1810.
- **James, Moore**, 15, Sweeting's Alley, 1808-38; 18, Cornhill, 1839-42; livery C.C. 1810. (See also Mitchell and French.)
- Frencham, James**, C.C. 1698.
- Freshfield, Jas.**; watch case coverer, 19, Smithfield.
- **James**, junior, admitted by redemption, C.C. 1774; letter as to non-payment of quarterage, 1796; centre seconds watch, about 1800.
- **James William**, son of the foregoing, admitted C.C. 1801.
- Frippett, John**, admitted C.C. 1665-70.
- Frisby, Jno.**, 5, Duke St., Grosvenor Sq., 1816-25.
- Frisquet, Peter**, 30, Lothbury, 1768-75.
- Frodsham, Wm.**, Kingsgate St., Red Lion Sq.; hon. freeman C.C. 1781. Earnshaw claimed to have taught him watch jewellery; he attested the value of Earnshaw's improvements in 1804; died, 1806.
- **William, and Son**, Kingsgate St., 1790-1806.
- **John**, 12, Kingsgate St., 1807-14.
- **William James**, Change Alley, F.R.S.; master C.C. 1886-37; died 1850. Some time in partnership with William Parkinson; bequeathed £1000 to C.C., to be known as the Parkinson and Frodsham Charity.

- He had four sons brought up to the trade: Henry who settled in Liverpool, George, who succeeded him, John, and Charles
- Frodsham and Baker**, 12, Kingsgate St., Bloomsbury, 1810.
- **John, and Son**, 38, Gracechurch St., 1825-42. (Jno. Frodsham, livery C.C. 1830.)
- **Charles**, son of W. G. Frodsham, born 1810, died 1871; a skilful and successful watchmaker, 7, Finsbury Pavement, 1842; afterwards succeeded J. R. Arnold, at 84, Strand. He conducted many experiments with a view of elucidating the principles underlying the action of the compensation balance and the balance spring, and wrote several papers on technical subjects. He was for some time a vice-president of the Horological Institute; master C.C. 1855-62.
- Fromanteel, Ahasuerus**, East Smithfield; Blacksmiths' Company, 1630; C.C. 1632 (see p. 195); 1630-50.
- **Ahasuerus**, Moses Alley, Bankside, admitted C.C. 1653-70.
- **Ahasuerus**, Ye Mermaid at Lothbury and Moses Alley, Bankside; apprenticed to Simon Bartram; C.C. 1663-75.
- **John**, Ye Mermaid at Lothbury; apprenticed to Thomas Loomes; 1663-80 (see p. 195).
- **Abraham**, son of Ahasuerus Fromanteel; admitted C.C. 1680-90.
- **and Clarke**, London, about 1680.
- Fry, Edward**, 13, Park Side, Knightsbridge, 1835.
- Fryer, William James**, 50, Cheapside, 1842.
- Fryett, S.**, 130, Whitecross St., 1823.
- Fueter, Berne**, about 1740.
- Fulkener, Edward**, C.C. 1702.
- Fuller, William**, admitted C.C. 1675.
- **Samuel**, 64, Red Lion St., Clerkenwell, 1811-40.
- **Crispin**, Monkwell St., 1817.
- Furness, John**, 9, Cross St., Hatton Garden, 1830.
- Furnesse, Thomas**, near Three Compasses, Gravel Lane, 1701.
- Furnifull, Richard**, C.C. 1722.
- Furnis, Thomas**, 25, Crawford St., 1840-42.
- Fury, Flack**, admitted C.C. 1658.
- Gabrier, Charles**, London; this name on clocks and watches 1705-20 may possibly be fictitious. (See Cabrier.)
- Gadsdon, Wm.**, London: long-case clock, about 1750.
- Gagnebin, Dan.**, Chaux de Fonds, about 1750.
- Gale, James**, 64, Cannon St., 1783-89.
- **John**, 5, Red Lion Court, Spitalfields, 1790-1829; Lamb St., 1800-42.
- Gambell, Thomas**, C.C. 1656.
- Gammage, I.**, musical clockmaker, 6, Bridgwater Sq., 1823; 8, Wood St., Goswell Rd., 1835-42.
- Gammon, Jno.**, London, watch, 1725, another 1760.
- Gamp, P. J.**, wood clockmaker, 28, Hatton Wall, 1835.
- Ganeral, Aug.**, 7, Baker St., Clerkenwell, 1835.
- Gannery**, chronometer maker; died 1851.
- Ganter, J.**, 39, Marshall St., London Rd., 1835.
- Ganthony, Richard**, 27, Cannon St., 1803; 49, Lombard St., 1807; 83, Cheapside, 1825; master C.C. 1828-9.
- **Richard Pinfold** (son of the above), 83, Cheapside; died while master C.C. 1845. (See Connell.)
- Gany, Thomas**, admitted C.C. 1699.
- Garde, Jas.**, London; maker of a bracket timepiece, square black case, minute circle within hour circle, about 1700.
- Garden, William**, C.C. 1712.
- **Philip**, St. Paul's Churchyard, 1759.
- Gardener, John**, admitted C.C. 1682.
- **Joseph**, Lancaster, 1767.
- **Henry**, 36, Norton Folgate, 1794-1804.
- Gardiner, John**, Croydon, admitted C.C. 1687.
- **Henry**, Rolis Buildings, Fetter Lane, 1759-60.
- Gardner, Thomas**, C.C. 1689.
- **William Obadiah**, C.C. 1711.
- **William**, Sandwich, maker of a walnut long-case clock and dial, about 1760.
- **Edward**, Lancaster, 1841.
- Garfoot, William**, C.C. 1680.
- Garland, John**, Barbican, liveryman C.C. 1776; 1766-98.
- Garle, Thomas**, Bennett Hill, livery C.C. 1766; master 1769; 1760-76.
- Garnegy, Chas.**, 55, King St., Soho, 1817.
- Garner, Thos.**, London; watch, 1770.
- Garnett, Wm.**, London, about 1680.
- Garnham, Abel**, 1, Lincoln's Inn Fields, 1816.
- Garnier, J. P.**, Paris; born 1801, died 1870.
- Garon, —**, London. In the B.M. is a

- watch of his, with day of the month circle, 1630-90.
- Garrard, Robt.**, 31, Panton St., Haymarket, 1815-18.
- **R. J. and S.**, 31, Panton St., 1822-42.
- Garrat, Hugh**, Ormskirk; maker of watches with Debaufre's dead-beat escapement, 1775-1800.
- Garret, Ferdinando**, maker of an English watch, ornamented with a Tudor rose, about 1600 (see p. 155).
- Garrett, Charles**, admitted C.C. 1690.
- **Charles**, admitted C.C. 1720.
- **William**, 188, Wapping, 1804-15.
- Garron, Peter**, admitted C.C. 1694; his bankruptcy noted *Lond. Gaz.*, Oct. 31, Nov. 4, 1706.
- Garth, John**, Aylesbury St., Clerkenwell, 1750-55.
- Gartly, Jno.**, Aberdeen, 1810.
- Gascoigne, Samuel**, C.C. 1676. "Lost, between Ludgate and Lothbury, on the 8th instant, a pendulum watch in a Tortoise-shell Case, with a steel Chain and 2 Swifles; made by Samuel Gascoigne" (*Lond. Gaz.*, July 14-18, 1692).
- Gass, David, and Co.**, 42, Oxford St., 1810-23.
- Gates, Francis**, London; watch, 1795.
- Gathercole, John**, London, maker of a bracket clock, silvered arch dial, about 1780.
- Gaudron**, à Paris, clock and watchmaker of repute, spoken of as an authority by Lepaute; watch by him, Mr. Henry Carr Glyn, 1710-30.
- Gaudy, J. A.**, Geneva, about 1780.
- Gaunt, John**, 2, Bridgewater Gardens, 1840-42.
- Gavelle, James** (alien), maker of a clock with square dial, boy and crown corners, "James Gavelle, Londini, fecit," on circle; admitted C.C. 1683; 1633-1700.
- Gaze, James**, Primrose St., Bishops-gate, 1782.
- **Samuel B.**, son and successor of James, a well-known clockmaker, 26, Princes St., Spitalfields, 1814-59.
- **Peter**, Liverpool Rd., son of Samuel B.; died 1892, aged 73.
- Gee**. (See Guy.)
- Gefael, U.**, 28, Langley Place, Commercial Rd., 1835-42.
- Gegenreiner, F. Z.**, Augsburg, about 1720.
- Gells, Thomas**, admitted C.C. 1720.
- George, Richard**, C.C. 1681.
- Gernon, Bernard**, apprenticed to Solomon Wagson, of Bristol; admitted C.C. 1659.
- Gerrard, John**, London; verge watch, h.m. 1740; bracket clock, about 1725.
- Gib, B.**, Rotterdam; watch, Nelthropp collection, about 1720.
- Gibbard, Thomas**, Quakers' Buildings, 1780-85.
- Gibbons, Richard**, C.C. 1730.
- **Benjamin**, admitted C.C. 1750; died 1769.
- **Joshua**, 45, White St., Borough, 1810-18.
- **John**, 6, King St., Clerkenwell, 1810-23; 64, Hatton Garden, 1836-42; livery C.C. 1811.
- Gibbs, Walter**, admitted C.C. 1648.
- **Thomas**, admitted C.C. 1681; master, 1711.
- **William**, admitted C.C. 1707; maker of a pair-case verge watch, *repoussé* case, 1707-20.
- **Jno.**, 11, Castle St., Aldersgate, 1815-19.
- **Thomas**, 11, Nichol Sq., Aldersgate St., 1825.
- **Geo.**, 38, Banner St., 1835-42.
- Gibson, James**, brother C.C. 1669.
- **Mary**, at the Dial and Crown, Newgate St., dealer in all sorts of clock and watchmakers' tools and materials, and for near twenty years the first in the business. Having acquired a good fortune with a fair character, she retired from business in 1757. (Ludlam.)
- **Jno.**; made a curious geographical clock, 1761.
- **Jno.**, Royal Exchange, C.C. 1800-10; succeeded by Jas. Bissett.
- **and Faust**, 5, Charlotte St., Rathbone Place, 1800.
- **Edward**, livery C.C. 1787; master, 1802; 1780-1803.
- **John**, (Jas. ?), Whalebone Court, Lothbury, 1761-1813.
- **C.**, 71, Bishopsgate Within, 1830.
- Gideon, Robert**, admitted C.C. 1691.
- Giffin, Thos.**, London, 1820.
- Gifford, Thomas**, C.C. 1693.
- Gilbard, Thos.**, watch case maker, Clerkenwell Green, 1793.
- Gilbert, Faustin**, C.C. 1661.
- **William**, admitted C.C. 1695.
- **Charles**, admitted C.C. 1700.
- **Philip**, 20, Cockspur St., 1807; 5, St. James's Sq., 1830. (See Green.)
- Gildchrist** (or Gilchrist) **Archibald**, C.C. 1729.
- **Sterling**, Lombard St., 1755-65.
- Gilkes, Jno.**, Shipston, on plate of watch, Mary Gilkes on dial, hall mark 1766.
- **Richard**, C.C. 1636.
- Gill, John**, admitted C.C. 1707.

- Gill, John**, Gracechurch St., 1753-65.
Gillier, C., Berne, maker of an oval watch, about 1650.
Gilpin, Edmund, petitioner for incorporation of C.C.; a watch by him mentioned in *Archæological Journal*, vol. xxii., 1630-71.
Gimblet, Jno., junr., and Vale, 106, Snow Hill, Birmingham, 1770.
Gingner, Anthony (French), admitted as a brother C.C. 1687.
Ginn, William, freeman C.C. 1699.
Giox, —, Paris; enamelled watch, about 1780.
Girard, Marc, Paris; oval, chased watch case of silver-gilt and rock crystal, Shandon collection, about 1600.
 — **Marc**, Blois; oval watch, Soltyskoff collection, about 1590.
Girardier l'Aine, Geneva, 1805.
Giraud, Christophe, Geneva, 1814.
Girod, Benj., London; repeating watch, 1775.
 — **Gasper**, an astronomical watch by him in B.M., about 1610.
 — **James** (French), C.C. 1693.
Giroust, Alexander, Coventry St., 1760; clock, Mr. Eden Dickson.
Gladstone, Thomas, C.C. 1703.
Glanville, Richard, Strand, 1775.
Glass, Alexander, 306, High Holborn, 1783.
Glazier, William, C.C. 1666.
Gleave, Matthew, a watch by him in Guildhall Museum, 1700.
Gleeter, —, London; watch, about 1740.
Glenny, —, watch-case maker, 20, Red Lion St., Clerkenwell, 1810.
 — **Joseph**, livery C.C. 1810.
Glover, Samuel, admitted C.C. 1694.
 — **Daniel**, admitted C.C. 1699.
 — **John**, admitted C.C. 1700.
 — **Richard**, admitted C.C. 1703.
 — **Boyer**, admitted C.C. 1740; died while serving as senior warden, 1768.
 — **—**, watch-spring maker, 81, Aldersgate St., 1800-5.
 — **J.**, 9, May's Buildings, St. Martin's Lane, 1835.
 — **Jno.**, chronometer maker; apprenticed to J. R. Arnold, 1835-80.
Gluck, Adam; watch by him in B.M. in a case of bloodstone, 1650-60.
Glyd, Jas., Westminster; watch, h.m. 1771.
Glynn, Richard, admitted C.C. 1705.
Gobert, Peter (French), admitted C.C. 1687.
 — **Matt.**, London; watch, 1760.
Godbed, William, Lombard St., maker of a watch, Whitcomb Green collection, inscribed "Gulielmus Godbed, Lumbard Street, Londini;" octagonal case, about 1620; another at the B.M., about 1640; signed a petition C.C. 1656.
Godbere, Saml., "late Mr. Stamp, 85, Cheapside," card Ponsonby collection.
Goddard, John, Hounsditch (from Paris), described as a Papist who resided with and worked for Isaac Sunes in Hounsditch, 1615-18.
 — **Benjamin**, admitted C.C. 1701.
 — **Nicholas**, Newark; maker of lantern clocks, 1700-20.
 — **Benjamin**, admitted C.C. 1727.
 — **Francis**, 49, Oxford St., 1792; 8, Rathbone Place, 1794-1825.
 — **T.**, 28, Pitfield St., 1814; 20, New Gloucester St., Hoxton, 1835.
Godfrey, Henry, admitted C.C. 1685.
 "A pretty large-sized Pendulum-watch in a Tortoiseshell Case; it shews the Hours and Minutes with a Sun and Moon Dial Plate, made by Henry Godfrey, London" (*Lond. Gaz.*, Oct. 7-10, 1700).
 — **George**, 22, Charterhouse St., 1835.
Godwin, John, 161, Strand. (See Goodwin.)
 — **Jas.**, 304, High Holborn, 1801-42.
Goff, Thos., 8, Rosoman St., 1793.
Gold, John, 118, Fleet St., 1806-19.
 — **Rich.**, London; watch, h.m. 1772.
Golding, J., 55, Cornhill, 1775.
Goldney, Thos., 4, St. James' St., 1815-25.
Goldsmith, John, C.C. 1681.
 — **William**, admitted C.C. 1719.
 — **John**, admitted C.C. 1720.
Golledge, Richard, Stratford, 1835.
Gom, David, Lyons; maker of a watch cased in jacinths, about 1650.
Gondoux, Jno., London; watch, 1780.
Gooch and Harper, 12, Red Lion St., Clerkenwell, 1810-13.
 — **Jno.**, 25, Banner St., 1814-18.
 — **Albert**, 13, Red Lion St., Clerkenwell, 1816-25.
 — **Wm.**, Bunhill Row, 1825.
 — **H.**, 25, Coppice Row, Clerkenwell, 1830.
Good, John, author of "The Art of Shadows; or, Universal Dialling," 2nd ed., London, 1711; admitted C.C. 1678.
 — **John**, 305, High Holborn, 1780-94.
Goodall, Jas., London; watch, 1779.
 — **Chas.**, 26, Bridges St., Covent Garden, 1793-1818.
Goodchild, John, admitted C.C. 1726.
Goode, Charles, brother C.C. 1686.

Goodfellow, Wm., 378, Oxford St., 1793.
Goodhugh, R. and B., 2, Welbeck St., Cavendish Sq., 1825-35.
 — **William**, 126, Regent St., 1825.
 — **Richard**, 32, Edward St., Portman Sq., from 2, Welbeck St., Cavendish Sq., 1840-42.
Goodlad, Richard, admitted as a brother C.C. 1689.
Goodman, Geo., London, 1771.
 — **H. N.** London; watch, 1820.
 — **J., and Son**, 1, New Chappel Place, Kentish Town, 1840-42.
Goodrich, Simon, received a reward from the Society of Arts, in 1799, for an improved escapement.
Goodwin, Wm., Stowmarket; lantern clock, about 1700; watch, about 1720; with the following on a paper in the outer case:—
 “Content thy selfe withe thyne estat,
 And sende no poore wight from thy gate;
 For why, this counsell I thee give,
 To learne to dye, and dye to lyve.”
 — **John**, 70, Strand, 1770-1800.
 — **James**, watch and clock ename-
 ler, 37, Red Lion St., Clerkenwell,
 1810-40.
Goodyear, John, admitted C.C. 1722.
 — **Joseph**, admitted C.C. 1732.
Gordon, John, Black Spread Eagle,
 Ludgate St., admitted C.C. 1698;
 bracket clock, black case, arch dial
 inscribed “John Gordon, London,”
 on oval silvered plate, 1698-1712.
 — **Robert**, Edinburgh; an eminent
 maker; admitted freeman of the
 Incorporation of Hammermen in
 1703, afterwards “boxmaster” or
 treasurer; was also captain of the
 trained band for protecting the city;
 a chiming clock by him in the Bank
 of Scotland, another in the possession
 of Mr. L. W. Auchterlonie, Amhurst
 Park, Stamford Hill, 1703-30.
 — **Patrick**, Edinburgh, 1705-15.
 — **Alex.**, Dublin; watch, about 1780.
 — **William**, 15, Cross St., Islington,
 1794-1805.
 — **Alex.**, 336, Strand, 1815-19.
 — **Theodore**, Great James St., Bed-
 ford Row, born at Barbadoes, appren-
 ticed in Aberdeen; horizontal and
 duplex escapement maker, also assis-
 tant of B. L. Vulliamy, sometime
 editor of the *Horological Journal*;
 died 1870, aged 81.
 — **Jas.**, London; watch, 1842.
Gorham, James, High St., Kensington,
 1815-42.
Gorsuch, Thos., Salop; watch, 1720.
 — **Thos.**, watch pillar maker, 199,
 St. John St., 1792.

Gosler, Thos., 51, Fore St., 1815-19.
Gosling, Richard, and Son, 55, Corn-
 hill, 1765-75.
 — **Joseph**, 55, Cornhill, 1780-85.
 — **Robert**, 160, Fenchurch St.,
 1770-85.
 — **Wm.**, watch case maker, 4, Cor-
 poration Row, 1793.
 — **Thos.**, watch case maker, 3,
 Staining Lane, 1793.
Goss, Jeremiah, admitted C.C. 1667.
Goubert, James, admitted C.C. 1890.
Gough, Wm., Devizes; watch, 1720;
 in each of the pillars a niche con-
 taining a silver statue.
 — **William**, London; watch, 1745;
 also a curious touch watch in the
 Guildhall Museum, about 1760; in
 this a push piece at the pendant
 drove a rod against a snail pivoted
 to the plate, and turned by a pin in
 the cannon pinion.
Gougy, Pierre Frederick, Tavistock
 St., Westminster; bracket clock by
 him at Windsor Castle, about 1730;
 patented in 1839 (No. 8308) a supple-
 mentary second hand, so adjusted
 by mechanism that it may be stopped
 while the other second hand is going,
 and on being set free will recover its
 original position, and rotate as before
 along with the other.
Goujon, Jean, Paris; cruciform watches,
 about 1590.
 — **Peter**, London; watch, 1735.
 — **Samuel**, 42, Newgate St.; master
 C.C. 1760; 1752-94.
Gould, Christopher, admitted C.C.
 1682. “Supposed to be drop’d in a
 Hackney coach on the 4th inst., a
 gold watch in a black shagreen caso,
 made by C. Gold, the word ‘Friend-
 ship’ graved on the Movement”
 (*Lond. Gaz.*, March 18-21, 1694).
 Mr. Jno. T. Trotter had a long-case
 clock by him of later date.
 — **Abel**, admitted C.C. 1683. “Lost
 on the 28th inst., a gold watch with
 two movements, having a black fila-
 green case studded like shells, made
 by Abel Gold” (*Lond. Gaz.*, March
 26-30, 1691).
 — **Thos.**, London; watch, 1780.
 — **Chester**, Red Lion St., Clerken-
 well. He patented in 1803 (No.
 2706) a nautical time glass, 1780-
 1803.
Goulon, à Paris; a watch by him in
 Guildhall Museum, short train,
 escape wheel of 17, handsome enam-
 elled case, an inch and one-eighth in
 diameter, and half an inch thick,
 about 1660. (See Crofts.)

- Gourlay, Alex.**, London; watch, 1785.
- Gout, Ralph**, 6, Norman St., Old St., 1770-1800; 122, Birch Lane, 1815. He patented in 1799 (No. 2351) apparatus for recording the paces made by man or horse, also an application of the invention for recording the revolutions made by the wheels of a carriage. Mr. Thos. Boynton has a bracket-clock by him, mahogany case, silvered dial, engraved with festoons, &c.; quarters chimed on eight bells. (See Recordon.)
- **David Ralph**, 122, Bunhill Row, 1830-42.
- Gow, Wm.**, London; watch, h.m., 1787.
- Goworth, John**, Oxford, 1791.
- Gowland, Jas.**, 11, Leathersellers' Buildings, London Wall, 1835; London Wall, 1860; died 1880. In 1837 he patented (No. 7456) a device for communicating motion to a balance through the balance spring.
- **Thos.**, 15, Bishopsgate Without, 1834; Leadenhall St., 1838-42.
- Grace, Wm.**, Cronton; sun and moon watch, about 1695.
- Gradelle**, London; watch, Schloss collection, about 1740.
- Grafton, John** (*alias* Solomons). In 1831, on the passing of an Act of Common Council, permitting the admission of Jews to the freedom, C.C. withdrew opposition to his election.
- **J. and E.**, 42, Coleman St., 1834; 81, Fleet St., 1838-42; afterwards Edward Grafton, who published a small, historical review of horology.
- **Henry**, 18, Barbican, 1840.
- Graham, George**, "Honest George Graham," a most eminent clock and watchmaker (see p. 183); C.C. 1695; master 1722; died 1751, aged 77.
- **W.**, London; fine repeating watch. Mrs. H. Sidebottom; S.K.M. 1724.
- **D.**, London; watch, 1798.
- **James**, 85, Piccadilly, 1800-5.
- **Jas.**, London; watch, 1825.
- Grainger**, —, Holborn Hill; watch, 1830.
- Grand, John**, 3, Cockspur St., 1780-1800. (See Fisher, Isaac.)
- Grandin, Jno.**, 2, Macclesfield St., Soho, 1815-19.
- Granger, Richard**, C.C. 1695.
- Grangier** (French) about 1650 (see p. 121).
- Grant, John**, 75, Fleet St.; apprenticed to Alexander Cumming, whose nephew he was. Hon. freeman C.C. 1781; warden 1810, when he died. Several specimens of his work are in the Guildhall Museum.
- Grant, John**, 75, Fleet St., son of the preceding, and an equally celebrated maker; admitted C.C. 1817; master five times 1838-67. He left Fleet St. in 1852, and for some years carried on a pawnbroking business in London Wall which had been bequeathed to him; he died 1882, aged 85. He was succeeded in Fleet St. by Henry Banister.
- **Chas.**, London; watch, 1800.
- **Jesse**, 16, Woodstock St., 1830.
- **and Terry**, 35, Prince's St., 1840.
- **Henry**, 9, Finch Lane, 1835.
- **William**, 36, Haymarket, 1835.
- Grantham J.**, London, 1750-70.
- Grape, John**, London; watch by him, Guildhall Museum 1737.
- Grave, Geo.**, 271, Whitechapel Rd., 1815-42.
- Gravell and Tolkein** (successors of Eardley Norton), 49, St. John St., 1790-1820.
- **William, and Son**, 49, St. John St., 1820; later and till 1850 at 29, Charterhouse Sq.; W. Gravell, master C.C. 1840; well-known watchmakers. On the outer cases of their watches were papers with the equation of time printed around the edge (see p. 133). They were succeeded by Robert Rolfe.
- Graves, Hy.**, 25, Goswell Terrace, 1835.
- **Benjamin**, admitted C.C. 1676; master 1705; clerk 1719, died 1731.
- Gray, Timothy**, admitted C.C. 1633.
- **Wm.**, Bond St., watch belonging to M. Cas. Sivan, about 1730.
- **Benjamin**, Pall Mall, clockmaker to George II. (see p. 239). In the Guildhall Museum is a gold repeating watch by him, which was made for Sir Peter Somes in 1732; 1720-60.
- **and Vulliamy**, Pall Mall (see p. 239), 1746-60.
- **and Constable**, Sackville St.; makers of a thin verge watch decorated with enamel and jewels, Guildhall Museum, about 1780.
- **Thomas**, 25, Strand, 1780; 42, Sackville St., 1793.
- **Adam**, 17, Berkeley St., Clerkenwell, 1788.
- **T. J. and G.**, 25, Strand, 1800-5.
- **Robert and William**, 13, New Bond St., 1793; William, 1800-28.
- **Jno.**, 68, Leadenhall St., 1817.
- **G. and W.**, 114, Fleet St., 1830.
- Graye**, —, subscribed £2 10s. for incorporation of C.C. 1630.

Grayham, Chas., London; watch, 1810.
Grayhurst, P. and M., 65, Strand, 1785-1800.

— **and Harvey**, 65, Strand, 1810-30.

— **Harvey, Denton, and Co.**, 64, Strand, and 128, Regent St., 1835-40.

Greatorex, Henry, admitted C.C. 1711. In the *Postman*, 1710, is an advertisement for a silver pendulum watch, lost in White Conduit Fields, for which Mr. Greatorex at Bushby's Folly offers a guinea toward, 1710-11.

Greatrex, Ralph, admitted C.C. 1653.

Greaves, Samuel, London, maker of marqueterie long-case clock, square dial, about 1720.

— **Thos.**, 92, High St., Birmingham, 1770.

Grebaual, Jerome; watch B.M. about 1600.

Grebaudel, Hierosme, Lyons; oval watch, Soltzkoff collection, about 1675.

Grebay, Phillipe, Paris; alarum watch S.K.M., about 1670.

— **Phillipe**, à Londres, on a watch, about 1610.

Greblin, —, about 1630.

Green, James, admitted C.C. 1664; maker of lantern clock with handsomely chased dial.

— **Joseph**, admitted C.C. 1723.

— **Margaret**, St. Martin's Court, Leicester Sq., 1765-71.

— **and Aldridge**, 62, St. Martin's Le Grand, 1765-85.

— **Jno.**, St. Martin's Court, 1750-70.

— **Richd.**, Richmond, Yorks., 1760.

— **Robt.**, Lancaster, 1767.

— **Edwd.**, 10, King's Stairs, Rotherhithe; watch for the Turkish market, Schloss collection, about 1790.

— **and Bentley**, makers of a very complicated long-case musical and astronomical clock, about 1790.

— **James**, 5, Fenchurch St.; Ludlam, in 1755, refers to him as a watchmaker and seller of tools; master C.C. 1784; 8, Philpot Lane, 1794.

— **Joseph**, tools, 129, Whitecross St., 1793.

— **Robt.**, London; watch, 1798.

— **Samuel**, 112, Bunhill Row, 1788-1800.

— **and Ward**, 1, Ludgate St., 1793.

— **Ward, and Green**, 1, Ludgate St., 1800; 20, Cockspur St., Pall Mall, 1817-38.

— **J., and Son**, 94, Hatton Garden, 1830.

— **Henry**, 10, Quebec St., 1835-42.

— **Robt.**, 20, Cockspur St., 1842.

— **Thomas**, 30, Rahere St., 1835;

9, Lower Ashby St., Northampton Sq., 1842; 1835-42.

Greenaway, Richard, C.C. 1718.

— **John**, 54, Bath St., St. Luke's, 1842.

— **John**, 4, St. John's Sq., 1842.

Greene, James, admitted C.C. 1685.

— **John**, admitted C.C. 1711.

Greenhill, Charles, watch-key maker, 12, Great Sutton St., 1842.

Greensill, Joseph, 36, Strand, 1775-1800.

— **Edwd.**, 34, Strand, 1793.

Greenwood, G., 12, Hanway St., 1817.

Gregg, Francis, apprenticed to John Clowes, 1691. "Francis Gregg, watchmaker, is removed from the Dial in Russel Street, Covent Garden, to the Dial in St. James St. over against the Palace Gates" (*Lond. Gaz.*, October 11-23, 1714). In the Guildhall Museum is a bell repeating watch by him, silver cap, 1698-1715.

— **Wm.**, London; watch, 1796.

Gregoire, P., à Blois; striking watch, about 1620.

Gregory, Jeremie, at ye Royal Exchange, admitted C.C. 1652; master, 1665, 1676; died 1685; a good maker of lantern clocks. In the *Lond. Gaz.*, Oct. 13, 1678, he advertises for Nester Holmes, aged 18, a runaway apprentice. "A silver watch with a String, made by Jeremiah Gregory, showing the days of the month; the Box engraven with the King's Picture in the bottom" (*Lond. Gaz.*, March 29, 1680).

— **Thomas**, admitted C.C. 1671.

— **Robert**, admitted C.C. 1678.

— **Jeremiah**, admitted C.C. 1694.

Gregson, Pierre, Paris, Horloger du Roy, maker of a watch, case finely enamelled, medallion with figure painting in centre, surrounded by a border of royal blue, 1780-90; p. 124.

— **John**, watchmaker to the Prince of Wales, 36, Bruton St., Hanover Sq., 1794-1800.

— **and Jefferson**, 36, Bruton St., 1800-5.

Gredon, Henry, at ye Royal Exchange; a crystal case irregular octagon-shaped watch by him in the S.K.M., about 1660.

Grennell, Richard, maker of a fine long-case clock, about 1750.

Gretton, William, of Black Fryers, maker of a lantern clock, balance escapement, dolphin frets, about 1665.

— **Charles**, The Ship, Fleet St., 1697, apprenticed to Lionel Wythe

- in 1662; master of C.C. in 1701; an eminent maker. To him was apprenticed in 1697 the celebrated Henry Sully.
- Grey, John**, 68, Leadenhall St., 1823-30.
- Gribelin, A.**, Blois. In the B.M. is a watch by him, dated 1600; another S.K.M., 1614.
- , Paris; watch by him B.M., case finely enamelled by Muisard, about 1700.
- Grice, Thomas**, admitted C.C. 1675.
- **Job**, Lancaster, 1797-1830.
- Griffin, John**, admitted C.C. 1720.
- and **Adams**, 76, Strand, 1800-23.
- **G.**, 30, King St., Clerkenwell, 1835.
- **F.**, 25, Gloucester St., Clerkenwell, 1835.
- Griffith, Jas.**, C.C. 1667.
- **Robert**, London; C.C. 1706; watch, 1725.
- **George**, admitted C.C. 1720.
- **Richard**, London; long-case clock, 1790.
- **J. W.**, 15, Wentworth Place, Mile End Road, 1840-42.
- Griffiths, Edward**, River St., Islington; livery C.C. 1810.
- and **Son**, 1, Ireland Row, Mile End Road, 1835.
- Grignion, Daniel and Thomas**; fine repeating watch with beautifully enamelled case, about 1730; another watch in the Dunn Gardner collection S.K.M. bears the hall mark for 1748; a clock in the possession of Mr. Eden Dickson is inscribed. "Dan. and Tho. Grignion from the late Mr. Quare." "Thos. and Danl. Grignion, finisher to the late Mr. Danl. Quare, at the King's Arms and Dial in Russel Street, Covent Garden," card Hodgkin collection.
- **Thomas**, 7, Great Russell St., Covent Garden (see p. 339); a watch by him with a *repoussé* case in S.K.M.; died 1784, aged 71.
- and **Son**, Russell Street, Covent Garden, 1775.
- **Thos.**, 7, Great Russell St., Covent Garden, 1800-25.
- Griliat**, —. In 1729 had a project for stamping dial plates for watches; discouraged by C.C. as being detrimental to engravers.
- Grimalde, Peter**, 431, Strand, a celebrated chronometer maker, 1800-10.
- and **Johnson**, 431, Strand, 1815-25. (See Anthony Wm.)
- Grimes, Thomas**, admitted C.C. 1671.
- **William**, admitted C.C. 1682.
- Grimley, William**, C.C. 1694.
- Grimshaw, William, senior**, 130, Goswell St.; died 1851, aged 80.
- **James**, 146, Goswell St.; died 1846, aged 43.
- **William**, eldest son of W. Grimshaw, senior, Goswell Rd.; died 1853, aged 54.
- **Frederick**, Goswell Rd. (Grimshaw and Baxter), died 1893, aged 77.
- Grimstead, Thomas**, St. Paul's Churchyard, 1753-63.
- Grindley, William**, 32, Crown St., Moorfield, 1820.
- Grinkin, Robert**, admitted C.C. 1632; master, 1648, 1654. In the B.M. are specimens of his work, one an oval watch with outer case of leather piqué. He died 1660; p. 155.
- **Edwd.**; petition C.C. 1656.
- Gritting, Jno.**, London; long-case clock, about 1750.
- Grizell, John**, admitted C.C. 1687.
- Grocot, Thos.**, Liverpool; a watch by him with Manx crest on cock, 1780.
- Grohe, James** (succeeded Haley), 7, Wigmore St., 1834-42.
- Grollier de Serviere, Nicholas**, born at Lyons in 1593, maker of many curious clocks and automata (see p. 288); died, aged 93.
- Grose, Richard**, admitted C.C. 1632.
- Grosrey, Caestlin**, 25, Newgate St., 1840-42.
- Grossmann, Moritz**, Glashütte, Saxony; winner of the prize offered in 1863 by the British Horological Institute for the best essay on the lever escapement. A very capable horologist; born 1826, died 1885.
- Grosvenor and Jones**, 85, Wardour St., 1815.
- Grounds, Jonathan**, about 1710.
- Grout, William**, admitted C.C. 1660.
- Grove, Thomas**, admitted C.C. 1715.
- **George**, 95, Wood St., Cheapside; admitted C.C. 1715.
- **Richard**, 93, Wood St.; livery C.C. 1786; 1770-1817.
- Grove, W. R.**, partner with Myles Brockbank; C.C. 1811-15.
- Grover and Co.**, 10, Greek St., 1817.
- Groves, George**, 105, Bishopsgate St., 1790-95.
- Gruet**, —, a Swiss, inventor of fusee chain, 1664.
- Guay**. (See Le Guay.)
- Gudin**, —, Paris; clock by him at Windsor Castle, about 1760; p. 277.
- Guerint, Francis**, Geneva, said to have invented engine turning, about 1780.
- Guest, Jno.**, 64, Fleet Market, 1816.
- Guibet, l'aine**, à Paris; clock, Jones collection S.K.M., about 1790.

Guillaume, George, 16, Myddelton Sq., 1842.

Gullock, Philip, 31, Minories, 1790-95.

Gunter, R., Queen St., May Fair, 1790-95.

Gurden, Benjamin, and Son, 144, Wood St., 1775; Benj. 1794.

Gutch, John, admitted C.C. 1673.

Gutheridge, William, C.C. 1728.

Gutteridge, John, 54, Coppice Row, 1835.

Guy, Henry, admitted C.C. 1702.

— **Charles**, admitted C.C. 1714.

— **Samuel**, London, maker of a fine long-case clock, decorated with Oriental lacquer work, about 1730; another clock by him belongs now to Mr. Wm. Craig, Detroit, U.S.A.

— **Edward**, 49, Rahere St., Goswell St., 1835; 19, Powell St., King's Sq., 1842.

Guye, Auguste, a pioneer of machine watchmaking in England; born at St. Olivier, Switzerland, 1835; settled in London 1856, where he died in 1893.

Gwillim, Eli, admitted C.C. 1648.

Gwinnell, J., 34, London Rd., 1812-15.

Habart, James, admitted C.C. 1682.

Habrecht, Isaac, maker of the second Strasburg clock, and an elaborate clock now in the B.M. (see p. 51), 1570-89.

Hackett, Simon, Royal Exchange; admitted C.C. 1632; master 1646-60. An early specimen of his production is a watch with a movement one inch in diameter, pierced square pillars. The dial of metal with a raised hour-band, whose extreme diameter is three-quarters of an inch; outside of it an engraved border with the figure of a cherub over the XII. Inside the hour-circle a view of Old London Bridge, tolerably well engraved. The case ornamented in high relief, and enclosed in an outer case of shagreen. The execution of the movement exceedingly rough, and on the top plate, partly hidden by the balance cock, an inscription, "Simon Hackett, of the Royall Exchanng, fecit," the form of the letters being as fanciful as the spelling; in the S.K.M. are an alarm watch by him, in a pierced and engraved silver case, and one in an enamelled case; 1620-60.

Hackings, John, successor to Haines, Hy. Ludlam in 1759 wrote, "has worked for me constantly since midsummer, 1753; all my best tools were

made by him; whatever has been done by him may be depended on."

Hackney, Thos., London; chime clock, eight bells, inch dial, marked centre, about 1740.

Haden, Thos., about 1720; maker of clock, handsomely carved case (see p. 320).

Hadley, Humfrey; received in 1708 16l. from the churchwardens of Aston, near Birmingham, for a new clock.

Hagger, James, Grove Hall Lane, maker of a square bracket-clock, Japanese case, cherub corners to dial, pull repeater, style about 1700.

Hague, Jas., London; watch, 1760.

Haines, Francis, admitted C.C. 1706.

— **Hy.**; "an excellent workman"; worked for Ludlam from 1747 to 1753, when he was succeeded by John Hackings.

— **Jno.**, 49, Northampton St., Clerk-enwell, 1835.

Hair, George B., 129, High St., Borough, 1835-42.

— **Wm.**, Birmingham; clock movement by him S.K.M., dated 1809; in Italian case, dated 1592.

Hairl, Jno., Horselydown, 1817.

Hale and Broadhurst, 81, Cheapside, 1800-5.

Haley, Thos., London; 1781.

— **Charles**, 7, Wigmore St.; a celebrated maker, hon. freeman C.C. 1781; patentee of a remontoire escapement for chronometers (1796, No. 2132). He was one of the experts appointed by the select committee of the House of Commons to report on Mudge's chronometers in 1793; 1770-1800.

— and **Milner**, 7, Wigmore St., 1800-15.

— and **Son**, 7, Wigmore St., 1832. (See Grohe.)

Halford, Robt., 3, Old Orchard St., St. Luke's, 1823.

Halifax, Sam. Joseph, London; watch, silver cock and name plate, 1775.

Halked, Thomas, admitted C.C. 1702.

Halksworth, William, 58, Fleet St., 1840-42.

Hall, Ralph, admitted C.C. 1638.

— **Peter**, admitted C.C. 1648.

— **Edward**, admitted C.C. 1710.

— **Wm.**, Woodborrow; long-case clock, about 1720.

— **John**; maker of long-case clocks and watches, about 1760.

— **Wm.**, 39, Gee St., 1814-19.

— **Wm.**, 93, High St., Marylebone, 1815-19.

- Hall, Charles**, 162, Fleet St., 1817; 118, Chancery Lane, 1820.
 — **Chas.**, 84½, Edgware Rd., 1840.
Hallam, E., 15, Bateman's Row, Shoreditch, 1835.
Halleway, —, London; clock-watch, about 1685.
Hallier, London, about 1800.
Hallifax, John, Fleet St.; maker of chime clocks. His bankruptcy noted *Lond. Gaz.*, June 14-17, 1740. Mr. Eden Dickson has a fine specimen of his work, a musical clock with automatic figures.
Hallsman, Wm., London; watch, 1790.
Hallus, alias Linus Franciscus, author of "Explicatio Horologii in Horto Regis," London, An. 1669 (see p. 9).
Hally, Thos., London; bracket clock, about 1660; watch, 1675.
Halsey, George, admitted C.C. 1687.
Halstead, Richard, C.C., 1669.
 — **Charles**, admitted C.C. 1677.
 — **John**, admitted C.C. 1698.
 — **William**, admitted C.C. 1715.
Halsted, Robert, Fleet St.; bad watch movement seized by C.C. 1662; admitted C.C. 1668; master 1699; 1662-1700.
Ham, John, 47, Skinner St., Snow Hill, 1820; 126, Newgate St., 1835-42, livery C.C. 1821.
Hambleton, George, C.C. 1669.
Hames, Jno., 9, Chandos St., 1835.
Hamilton, Richard, C.C. 1712.
 — **Jas.**, London; watch, 1800.
Hamlet, Thos., 1 and 2, Prince's St., Soho; in partnership with Francis Lambert, 1800; subsequently carried on business by himself; maker of a gold horizontal watch for the Duke of Sussex, 1795-1832.
Hamley, J. O., 1, Warwick Place, Bedford Row, 1800-10; 24, Red Lion St., Holborn, 1816-40.
 — **junr.**, Newcastle St., Strand; maker of bracket clocks, about 1810.
 — **J. O., and Son**, 284, Holborn, 1815.
 — **O. Jas.**, 23, Duke St., St. James's Sq., 1815-18.
Hamlin, Richard, London; bad watch of his seized by C.C. 1676.
Hammon, J., 9, Northampton Sq., Clerkenwell, 1840-60.
Hammond, John, admitted C.C. 1680.
 — **and Co.**, 45, St. Martin's-le-Grand, 1768.
Hampton, W., and Sons, 77, Theobald's Rd., 1842.
 — **Rd.**, London; watch, 1782.
Hancock, Thomas, 17, Bond St., 1830-35.
Hancorne, Thomas, admitted C.C. 1658; elected warden, 1683, but excused on paying a fine.
 — **William**, admitted C.C. 1676.
Handcock, Edward, 23, Queen St., Clerkenwell, 1842.
Hande, Thomas. In the B.M. is an oval tulip-shaped watch by Thos. Hande, about 1700.
Handiside, Geo., London; repeating bracket clock, about 1720.
Handley and Moore, apprentices of Jno. Thwaites, 39, Clerkenwell Close, 1798; a specimen of their work B.M.; G. Handley died 1824. (See Moore, Jno., and Sons.)
Hands, Tim., London; maker of a watch in the Guildhall Museum, about 1750; another 1765.
Hanet, John and George, Porter St., Leicester Fields, 1768; a specimen of their work B.M.
Hangel, Johann, Schodeck; cruciform watch, Soltykoff collection, about 1580.
Hanks, Benjamin, Litchfield, Connecticut, U.S.A., patentee of self-winding clock with air vanes, 1783.
Hannet, Samuel Stephen, London, maker of long-case clocks, about 1780.
Hannington, Wm., London; watch, 1800.
Hansard, William, watch-springmaker, 6, King's Head Court, Holborn, 1790.
Hanslapp, Robert, C.C. 1653.
 — **William**, admitted C.C. 1603.
Hanson, Charles, 160, High Holborn, formerly of Huddersfield. In 1845 he patented a detent escapement (No. 10,876), 1839-45.
Hanush, —, maker of a clock for Prague Town Hall, about 1497.
Hanwell, Zachariah, admitted C.C. 1694, maker of a fine marqueterie long-case clock, straight pillars, square dial, cherub corners, "Z. Hanwell, Londini," on circle.
Happock, London, a maker of watches, about 1700.
Harbert, William, C.C. 1670.
Harbottle, Cornelius, C.C. 1667.
Harbud, Jeremiah, watch-movement maker, 2, Green Terrace, 1810-38; livery, C.C. 1812.
Harcourte, —, maker or repairer of clocks, near Westminster Abbey, 1469 (see p. 44).
Harden, Chas., 120, Fleet St., 1816-25.
Harding, John, admitted C.C. 1685.
 — **Wm.**, London; watch for the Dutch market, finely embossed outer case, 1769.

Harding, Francis, admitted C.C. 1687.

— **John**, admitted C.C. 1721.

— **Robert**, London, 1753.

— **Thomas, and Co.**, 43, Minories, 1760-1800.

— **Sam.**, 131, Oxford St., 1816-23.

— **and Co.**, 26, Gt. Winchester St., 1817.

— **Henry**, 1, Holles St., Cavendish Sq., 1840.

Hardwidge, Wm., 52, Wapping, 1823.

Hardy, John, 8, Bridgewater Sq., 1760-90; livery C.C. 1776.

— **Joseph**, 26, Clement's Lane, Lombard St., 1800.

— **Thomas**, watch-case maker, 14, Rosoman St., Clerkenwell, 1820.

— **William**, 28, Coppice Row, Cold-bath Sq., Clerkenwell. A chronometer and clockmaker of repute. Among other inventions he devised an escapement for clocks for which he in 1820 received from the Society of Arts the gold medal and fifty guineas, and a compensation balance, 1800-30.

Hare, Alexander, 17, Grenville St., Hatton Garden; hon. freeman C.C. 1781; maker of a finely enamelled watch, h.m., 1782; a verge metal watch by him in the Guildhall Museum; 1770-1815.

Harker, George, master C.C. 1852.

Harland, Theodore, Norwich, Conn., U.S.A.; to him was apprenticed Ely Terry in 1786.

Harlock, James, 7, Horseferry Rd., Westminster, 1842.

Harlow, Samuel, Ashbourne, Derby, in 1789 patented (No. 1708) the Breguet or tipsy watch-key, in which the upper and lower portions are connected by means of a ratchet clutch kept in gear by a spring, so that the upper part will turn the lower part in the proper direction for winding, but if the upper part is turned in the opposite direction, the ratchet clutch slips without moving or straining the lower part of the key. In 1813 he published "The Clockmakers' Guide to Practical Clockwork." He there describes himself as clockmaker and brass-founder, Summer Hill, Birmingham, but mentions that his book may be obtained at his house in Ashbourne and also of Walker and Sons, 49, Red Lion St., Clerkenwell.

Harman, John, "watchmaker and astrologer," of Bloomsbury, 1753.

— **George**, High Wycomb, maker of the chimes of Cripplegate Church, 1792.

Harmar, Jas., London; watch, 1690.

Harmer, Jasper, near Smithfield Bars, cited by C.C. for exercising the art of clockmaker without having served seven years, 1685.

Harns, Geo., Old Jewry, 1808-10.

Harold, Richard, admitted C.C. 1690.

Harper, Henry, Cornhill, admitted C.C. 1664; watch by him in silver case, Schloss collection, said to have belonged to Cromwell's daughter Bridget; the arms of the Protector incorporated with the royal arms are engraved on the case. In 1688 at the Mayor's Court some watch or pocket clock chains of steel belonging to him, and seized by C.C., were declared to be insufficient, and broken. He was the maker of a clock which stood in the hall of the Ironmongers' Company from about 1689 to 1889; another example is a long-case clock going for twenty-eight days; a gold watch by him mentioned in *Lond. Gaz.*, Jan. 11, 1691; 1664-1708.

— **Thomas**, assistant C.C. 1761; maker of a fine eight-day clock, Chippendale style of case, also of a watch in the Guildhall Museum, 1750-61.

— **John**, 1, Pear Tree St., Goswell St., 1810; 16, St. John St., 1815; 78, Goswell Rd., 1825.

— **Thos.**, 207, Fleet St., 1800-30.

Harrache, Thos., Pall Mall, 1765-75.

Harris, John, one of the first assistants C.C. 1631; master 1641.

— **John**, admitted C.C. 1659.

— **Richard**, said to have been the maker of a pendulum clock for St. Paul's Church, Covent Garden, in 1641 (see p. 338); 1641.

— **Thomas**, in y^e Strand; maker of a good lantern clock, one hand, fret Fig. 303, inscribed, "Thomas Harris, in y^e Strand," about 1680.

— **John**, admitted C.C. 1677; master 1688.

— **Anthony**, admitted C.C. 1683; known as a maker of lantern clocks, 1670-90.

— **John**, admitted C.C. 1690.

— **Francis Wm.**, admitted C.C. 1702.

— **Samuel**, admitted C.C. 1708.

— **Christopher**, Lombard St., admitted C.C. 1695; 1695-1720.

— **Henry**, admitted C.C. 1711; maker of silver verge watch, silver dial, 1711-20.

— **Geo.**, Fritwell; clock, about 1730.

— **William**, Temple Bar, liveryman C.C. 1776.

- Harris, Thos.**, St. Sepulchre's. In 1770 he patented (No. 965) a rotating dial.
- **William**, 27, Goswell St.; master C.C. 1830, 1832; 1790-1833.
- **Richard**, 27, Old Jewry, 1790-1810.
- **John**, 27, Old Jewry, 1800-8.
- **L.**, Brown Lane, Spitalfields, 1810.
- **Jas.**, 8, Parliament St., 1820.
- **H.**, 6, Curtain Rd., 1815-25. Geo. Harris, same address.
- **John**, 22, Gloucester St., Clerkenwell, 1835.
- **Wm.**; watch-case maker, 21, Red Lion St., Clerkenwell, 1835.
- **Clement**, 76, Cornhill, 1822-42; livery C.C. 1825.
- **John James**, 11, Upper East Smithfield, 1840-42.
- Harrison, George**, apprenticed to Johana May and Thomas Tompion, admitted C.C. 1698.
- **William**, admitted C.C. 1699.
- **Anthony**, Birchin Lane, admitted C.C. 1701. In 1721 appeared an advertisement respecting a small gold watch made by Anthony Harrison, and lost between Leadenhall and "Spittelfields" markets. The finder was offered nine guineas reward, and no questions asked, if the watch were restored to Mr. John Chadwell, goldsmith, Castle Alley, Birchin Lane, 1701-20.
- **John**; born, 1693; died in Red Lion Sq., and buried in Hampstead churchyard in 1776 (see p. 215).
- **James**, Barrow; brother of the preceding; a long-case clock by him is in the Guildhall Museum, 1720-50.
- **Edwd.**, Warrington; centre seconds watch, 1795.
- **Wm.**, 48, Fetter Lane, 1780-94.
- **Thos.**, 68, Fetter Lane, 1795-1804.
- **—**, Regent St.; watch, with hare and snail indicator, 1810.
- **James**, Barton-on-Humber; a grandson of John Harrison and a clockmaker of some celebrity, made a fine clock for Christ Church, Hull, 1810-30.
- **James**, Waterbury, Conn., U.S.A., founder of the Connecticut wooden clock industry, 1790-1830.
- **Francis**, 91, Broad St., Ratcliff, 1835-41.
- Harrocks**, Lancaster; Josh., 1748; Jno., 1783.
- Harrys (Harris), Thomas**, Water Lane; maker of the celebrated clock with figures on the front of Old St. Dunstan's Church, Fleet St. (see p. 206), 1671.
- Harshell, D.**, 12, Bevis Marks, 1830.
- Hart, Noe**, admitted C.C. 1695.
- **John**, admitted C.C. 1720.
- **Henry**, admitted C.C. 1720.
- **S. and M.**, 52, Prescott St., Good-man's Fields, 1804-18.
- **and Harvey**, 5, King's St., Finsbury, 1825.
- **Andrew B.**, London; watch, 1830.
- **Napthali and Son**, 5, King's St., 1835-42.
- **Maurice**, 6, Haydon Sq., 1842.
- Hartley, —**, New St., Shoe Lane; cited by the C.C. for trading in watches and clocks without having served seven years in the trade, 1680.
- **Jer.**, Norwich; fine bracket clock, about 1705 (see p. 328).
- **Jno.**, George Court, Red Lion St., 1790-94.
- Hartmans, John George**; watchmaker to the University of Halle, 1756.
- Hartnup, John**, superintendent of Liverpool Observatory, Birkenhead. He invented a compensation balance, with an oblique laminated rim, and tabulated the errors arising from the change of temperature in ordinary chronometers, 1840-80.
- Hartung, Chas.**, 61, St. Martin's Lane, 1840.
- Harvey, Samuel**, admitted C.C. 1696.
- **Alexander**, admitted C.C. 1726.
- **John**, 16, Fenchurch St., 1798-1800; 3, Falcon St., 1815; 1798-1818.
- **and Co.**, 2, King's St., Finsbury, 1830.
- **George**, 110, High St., White-chapel, 1830; 22, Cannon St. Rd., 1840; 142, Ratcliff Highway, 1842; 1830-42.
- Harward, Robert**, C.C. 1730.
- Harwood, Laurence**, "Acorn," Belle Sauvage Yard; died 1716.
- Haskins, William**, 79, Quadrant, Regent St., 1830.
- Hasleden, Charles**, 20, Waterloo St., 1840.
- Haslewood, Roger**, 53, Salisbury Court, 1772.
- Hasluck, J.**, London; watch, with sun and moon hour indicator, about 1685.
- Hassell, Joshua**, 1746. (See Atkins, F.).
- Hassenius, James** (alien), admitted C.C. 1682.
- Haswell, Alex.**, 10, Clifford St., New Bond St., 1780-94.
- **Archibald**, 13, Skinner St., Clerkenwell, 1835; 8, Woodbridge St., Clerkenwell, 1840-42.
- **Robert**, 12, Upper Ashby St., 1842, afterwards at 49, Spencer St., Clerkenwell; died 1874, aged 58.

Hatch, John, admitted C.C. 1693.
Hatchman, James, C.C. 1680.
Hatfield, D.; watch, h.m. 1737.
Hathornthwaite, Lancaster; Peter, 1703; Jno. 1744.
Hatton, Thomas, Lombard St.; watchmaker, and author of "Introduction to the Mechanical Part of Clock and Watch Work," published 1773; 1760-74.
 — **Sam.**, London; watch, 1775.
 — **James**, 45, St. Michael's Alley; apprenticed to Geo. Margetts; admitted C.C. 1799; livery 1810; 1799-1812.
 — **Joseph Yorke**, 40, Tooley St., livery C.C. 1810; St. Magnus, London Bridge, 1830. Many watches inscribed "Yorke Hatton, Thames St."
 — and **Harris**, 4, St. Michael's Alley, Cornhill, 1816-20.
 — **Wm.**, Horselydown, London, 1830.
 — **Geo. C.**, Lancaster, 1826.
 — **J.**, 15, Store St., 1835.
Hautefeuille, John (The Abbé), Paris, born 1647, died 1724. He is said to have invented, about 1722, the rack leverescapement, which was patented in England by Peter Litherland in 1791. Huygens, endeavouring to obtain a French patent for the balance spring, was successfully opposed by the Abbé, who claimed to be the prior inventor of it.
Havelland and Stephens, 32, Aldgate High St., 1794.
Hawes, John, 31, New Bond St., 1775.
Hawkesbee, Benjamin, C.C. 1709.
Hawkesworth, John, C.C. 1709.
Hawkins, James, C.C. 1730.
 — **Thomas**, C.C., 6, Castle Alley, Cornhill, 1777-1816.
Hawley, Thos. and Co., Strand; "watchmaker to His Majesty," 1795-1828.
 —, —, 120, Fleet St., card Hodgkin collection, about 1830.
 —, —, High Holborn, 1860-62.
 — **John**, 56, Frith St., Soho, 1842.
Hawthorne, Ferguson and Co., London; watch, 1808.
Hay, Alexander, Edinburgh; 1718.
 — **Peter**, 20, Davies St., Berkeley Sq., 1805-40.
Hayden, William, C.C. 1717.
 — **John**, Deptford; maker of a long-case clock, about 1710.
Haydon, William, Croydon, C.C. 1687.
Hayes, Walter, admitted C.C. 1654; master 1680.
 — **Edmond**, admitted C.C. 1682.

Hayford, Henry, 2, Star Alley, Fen-church St., 1842.
Hayley, William, 38, Gt. Marylebone St., 1788-93.
Haynes, John, admitted C.C. 1676.
 — and **Kentish**, 18, Cornhill, 1804-18.
Hayton, F., London; watch, 1760.
Hayward, William, C.C. 1720.
 — **John**, 22, Bush Lane, Cannon St., 1820.
 — **Robert**, Bermondsey, 1815-35.
 — **J.**, 2, Summers Court, Bishopsgate Without, 1835-42.
Haywood, Peter, Crediton, Devon. In 1766 he patented (No. 836) a calendar ring.
Head, Thomas Cartwright, apprenticed to Christopher Gould in 1693.
Headworth, P., 46, St. John's St., 1815-42.
Heady, George, admitted C.C. 1682.
Heap, Richard, 5, King St., Covent Garden, 1800-4; 39, Maiden Lane, 1815-25.
Hearn, Hen., London; watch, 1775.
Heath, J., London; watch, h.m., 1770.
Heathcock, Timothy, admitted C.C. 1698.
Hebert, Anthony, "Moorefields, nere London," 1660; bracket clock about 1690, inscribed, "Anthony Hebert in Porter Street."
 — **J.**, Brightelmston, about 1716.
Hebting, F., wooden clockmaker, 19, Moor St., Soho, 1835.
Heck. See De Heck.
Heckel, Francesco, à Fridberg, 1730.
Heckstetter, Joseph, C.C. 1694.
Hedge, Nathaniel, Colchester; lantern clocks, about 1740; also a fine long-case clock, about 1780.
 — and **Banister**, Colchester, known as makers of long-case and other clocks, about 1800; watch by them, 1808.
Hedger, W., London; watch, 1790.
 — **George**, 48, Gt. Sutton St., 1822-35; 10, St. John's Row, St. Luke's, 1842.
Hedges, John, 4, St. James's Walk, Clerkenwell, 1800.
Heeley and Burt, Deptford, 1780.
Heerman, John (Dutch), C.C. 1691.
Heffer, W., 2, George St., Grosvenor Sq., 1835.
Heidmark, P., London; watch, 1780.
Heitzman, F., and Co., 40, Norton Folgate, 1840.
Heizman, Matthew, 1, Charles St., Soho Sq., 1840.
Helden, Onesiphorus, admitted C.C. 1632; warden, 1648; did not become master.

- Hele, Peter**, Nuremberg, invented the mainspring, 1500 (see p. 56); died 1540.
- Heliger, J.**, Zug.; crystal cased watch about 1590.
- Hellam, James**, admitted C.C. 1689.
- Heming, Thomas**, Piccadilly, 1763; 131, New Bond St., 1769-75.
- **Artis**, Shadwell, liveryman C.C. 1776.
- **and Crawler**, New Bond St., 1780-90.
- **Geo.**, 151, New Bond St., 1793.
- Hemlett, J.**, London; watch, 1810.
- Hemmen, Edward**, London; watch about 1710; another h.m., 1760.
- Hemming, Hen.**, London; watch, 1780.
- Henche, Uldrich**. Payment to him of £100 for a clock "in manner of a branch," made by him and set up at Whitehall, 1605.
- Henderson, Robt.**, Edinburgh; watch S.K.M., about 1750.
- **John**, 13, Broad St., Exchange, 1775; 21, Cornhill, 1783-1800.
- **Robert**, St. Martin's Court, 1772; 18, Bridgewater Sq., 1800-5.
- Hendricks, Aaron**, Devonshire St., 1760-68.
- Henley, J.**, London; watch, 1810.
- **Thos.**, London; watch, 1829.
- Hennett and Son**, 16, Foster Lane, 1772.
- Hennon, William**, C.C. 1674.
- Henriot**, à Geneva; watch in case of tinted gold S.K.M., about 1785.
- Henry, W. and S.**, 44, Taylor's Buildings, Islington, 1804.
- **S.**, 59, Lower Brook St., 1810.
- **S.**, 70, Lemon St., 1830.
- **Stephen**, 3, Berkeley Sq., 1835-40.
- Henshaw, Walter**, admitted C.C. 1667; master, 1695.
- **John**, admitted C.C. 1696.
- Herant, Brothers, and Son**, Berlin, makers of an enamelled watch, S.K.M., about 1680.
- Herbert, Edward**, C.C. 1664.
- **Wm.**, London; watch, without a balance spring, about 1670.
- **Thomas**, Whitehall, C.C. 1676.
- **Evan**, admitted C.C. 1691.
- **Cornelius**, London Bridge, 1670-96.
- **Cornelius**, London Bridge, apprenticed to the above C. H., 1690; admitted C.C. 1699; master, 1727.
- **Morgan**, clock-watch, 1690.
- **Edward**, admitted C.C. 1710.
- **Henry**, admitted C.C. 1713.
- Herman, Ignaz**, 13, Compton St., Clerkenwell, 1840.
- Herring (Herren) Joshua**, 38, Cornhill, known as a maker of bracket clocks, 1753-75.
- **John**, free C.C. by redemption, 1770.
- Hertford, John**, admitted C.C. 1632.
- Hertham, T. S.**, London; watch, 1795.
- Hesk, William**, Horseferry Rd., Westminster, 1835.
- Hessicht Dionistus**; book-shaped watch, 1627 (see p. 101).
- Hester, Henry**, admitted C.C. 1670.
- **Henry**, admitted C.C. 1687.
- "Lost in Whitehall, on Sunday, the 26th past, a Gold Watch with a plain Outside Case, made by — Hester, of West minster, with a ribbon tied to it of Changeable Purple and Gold, and upon that two Seals, the one an Onyx with a Head cut in it, set with small Diamonds; and the other Seal a Stone set with rubies. Whoever brings the said Watch, etc., to Mr. Snagg, Goldsmith, in Lombard St., shall have 5 guineas reward" (*London Gaz.*, July 30, Aug. 3, 1691).
- Hewison, Chas.**, London; watch, 1800.
- Hewitt, Alexander**, London C.C. 1725; watch, 1730.
- **Benjamin**, admitted C.C. 1724.
- **Sam.**, 60, St. Martin's Lane, 1836.
- **Thomas**, 12, Upper Ashby St., and 10, King St., Tower Hill; a chronometer maker who devised different forms of compensation balances; was a director of the British Watch Company; born 1799, died 1867.
- Hewkley, John**, admitted C.C. 1732.
- Heywood, William**, 12, King St., Covent Garden, 1807-10; 35, Goodge St., 1815-42.
- Heyworth, John**, 218, Tottenham Court Rd., 1823.
- Hibbert, John**, 7, Jewry St., Aldgate, 1840.
- Hiccox, Jno.**, London; repeating watch, 1735.
- Hickling, John**, 122, St. John's St., Clerkenwell, 1835-42.
- Hickman, Joseph**, 20, Bridgewater Sq., 1779.
- **Wm.**, 89, Borough, 1816-25.
- Hicks, Thomas**, admitted C.C. 1664.
- "Lost Sep. 21, betwixt Ingerstone and Rumford, a watch with a silver-pinned Case, showing the day of the month, the hour of the day, made by *Thomas Hicks, Londini*, with a blue taffety ribon fastened to the key thereof. Whoever will give notice thereof to Mr. Christopher

- Maynard, watchmaker at the Royal Exchange, London, shall have 40s. reward" (*Lond. Gaz.*, Sept. 23-27, 1675).
- Hicks, Thomas**, admitted C.C. 1666.
- **John**, admitted C.C. 1694.
 - **Samuel**, London; about 1780.
 - **Jas.**, 112, Whitechapel, 1804-15.
 - **Chas.**, 112, Whitechapel, 1810-15.
- Hickson, Thomas**, C.C. 1690.
- Higgins, Banger**, C.C. 1724.
- Higginson, Henry**, C.C. 1662.
- **Samuel**, admitted C.C. 1697.
Hatton speaks of the splendid polish of the work of Higginson Brothers, watch finishers.
 - **John**, 27, Strand, 1790; 38, Southampton St., Strand, 1798-1815.
- Higgnett, Jno.**, London; watch, 1725.
- Higgs, John**, admitted C.C. 1661.
- **Thomas**, admitted C.C. 1716.
 - **Robert and Peter**, 7, Sweeting's Alley, 1750-69; Peter Higgs was master C.C. in 1767.
 - **Robert**, London; half-quarter repeating watch, 1785.
 - **and Evans**, 7, Sweeting's Alley, 1785-1820; a verge watch movement by them, with curious pillars, in the Guildhall Museum; bracket clock inscribed, Higgs and David Evans, London.
- Highfield, Josiah**, 55, Rosoman St., 1790-94.
- Highmare, Edward**, C.C. 1687.
- Highmore, Jacob**, 52, Aldersgate St., 1790-94.
- Hill, John**, petitioner for incorporation of C.C. 1630.
- **Benjamin**, admitted C.C. 1641; master 1657. In the B.M. are specimens of his work, one a small circular watch in a blue steel case, with exceedingly handsome covering of flagree gold; another plainer with outer case of shagreen. He died 1670.
 - **Francis**, admitted C.C. 1679.
 - **Thomas**, Fleet St. His name was engraved, in conjunction with that of Henry Harper, on a long-case clock which stood in the hall of the Ironmongers' Company from about 1689 to 1889. There was also on the clock the further inscription, "The gift of John Woolfe, member of the Company." "Thos. Hill, over against Chancery Lane, Fleet St." Card Ponsonby collection.
 - **Edward**, admitted C.C. 1698.
 - **John**, admitted C.C. 1705.
 - **John**, Fleet St., admitted C.C. 1731; 1731-60.
- Hill, Thomas**, Aldersgate St., 1777-86.
Thomas Hill was the maker of a gold verge watch, embossed case, said to have belonged to Captain Cook.
- **Chas.**, 3, Charing Cross, 1793-95.
 - **Jas.**, 5, Ball Alley, Lombard St., 1793-1810.
 - **Sampson C.**, 9, Ball Alley, Lombard St., card Hodgkin collection, about 1815.
 - **John**, 15, James St., Covent Garden, 1820.
 - **Leonard**, 61, Fleet St., 1817-23.
 - **Sam.**, 13, Hooper St., Clerkenwell, 1842.
- Hillcoat, William**, 33, Queen St., Cheapside, 1790-94.
- Hilliard, G.**, 35, Queen St., Cheapside, 1820.
- Hillier, James**; watch-glass maker, 12, Church St., Spitalfields, 1790-1810.
- Hills, Fleet St.**, 1774.
- Hillyard, William**, C.C. 1679.
- Hilton, John**; apprenticed to Tompion, admitted C.C. 1698.
- Hilton**, —, London; watch, 1840.
- Hind, Paris**; watch jeweller, 26, Spa Rd., 1790-94.
- Hinde, Benjamin**; musical clockmaker, 20, Banner St., Clerkenwell, 1835-40.
- Hindley, John**; a man of good repute, 1730-65; he made a clock for York Cathedral in 1752.
- **Henry**, York; a clever clock and watchmaker; watch by him in S.K.M., London h.m. 1766; in 1770, while in London, he devised an improved wheel-cutting engine (see Brown, J.), 1722-74.
- Hine, Thos.**, Fleet St., 1760-74.
- **John**, 68, Red Lion St., Clerkenwell, 1790-94.
- Hinton, J.**, 91, Boro', 1815-20, 20, Tabernacle Row, Finsbury, 1835.
- Hiorne, John**, admitted C.C. 1707; master, 1744; 1707-45.
- Hiscocks, T.**, 9, Princes St., Drury Lane, 1835.
- **Zachariah**, 7, Little Russell St., Covent Garden, 1840-42.
- Hislop, Richard**, Rosoman St., Clerkenwell, 1775-1803.
- **Richard**, son of the above, 53, Rosoman St., 1840-42.
 - **William**, younger son of the first-named Richard, 15, Rosoman St., 1820; 96, St. John St. Rd., 1835-72; he was some time hon. sec. and an active member of the governing body of the Horological Institute; he died in 1876.
- Hitchen, John**, London, C.C. 1720; watch, 1740.

- Hitchins, Joseph**, Brown's Buildings, St. Mary Axe, 1779-94.
- Hobbs, James**, Lambeth, 1830.
- **Jas.**, 142, Gt. Tower St., 1830.
- Hobler, Paul**, Porter St., Newport Market, hon. freeman C.C. 1781; 1770-90.
- **Fras.**, Porter St., Newport Market, 1793.
- Hobson, John**, petitioner for incorporation of C.C. 1630.
- **James**, 21, James St., Oxford St., 1835.
- Hochicorn, Isaac**, C.C. 1728.
- Hock, C.**, wooden clockmaker, 40, Charles St., Hatton Garden, 1840.
- Hocker, John**, Reading; maker of lantern clocks, 1688; admitted C.C. 1729.
- **Jos.**, Basingstoke; 30-hour clock, about 1740.
- Hockson, Jno.**, London; watch about 1700.
- Hodde, John**, Reading; maker of lantern clocks, 1688; admitted C.C. 1705.
- Hodge, H.**, London; watch 1795.
- Hodges, Nathaniel**, in "Wine Office Courte, Fleete Street;" admitted C.C., 1681; known as a maker of bracket clocks, 1680-1700.
- **William**, admitted C.C. 1719.
- , 227, High Holborn, card B.M. 1780.
- **Fredk.**, Dublin; rack lever watch, about 1806.
- **J.**, Beauvoir Place, Kingsland Rd., 1835.
- Hodgkin, Sarah**, admitted C.C. 1699.
- **Robert**; maker of an eight-day square dial clock, Queen Anne period, fine movement, inscribed, "Rob. Hodgkin, Londini," about 1705.
- Hodgson, York**; watch inscribed "Mark Hodgson, Eboraci," about 1710.
- Lancaster; Hy., 1816; Wm., 1820.
- Hodsoll, William**, 31, Primrose St., Bishopsgate, 1800-8.
- **William**, 29, Ratcliff Row, City Rd., 1842.
- Hogan, J.**, watch movement maker, 6, Badgers Yard, St. John St., 1808-20.
- **and Smith**; watch movement maker, 15, King St., Clerkenwell, 1835.
- Hohwii**, Amsterdam; died 1889.
- Holds, Chas.**, Silver Dials, St. Bartholomew Close, 1793.
- Holdway, George**, 305, Strand, 1779.
- Hole, Henry**, 11, Lisle St., Leicester Sq., 1810; 12, Kingsgate St., 1817-23.
- Hole, F. W.**, Weymouth Terrace, City Rd., patented a mainspring in 1852 (No. 40).
- Holeyard, Samuel**, C.C. 1705.
- Holland, George**, petitioner for incorporation of C.C. 1630-55.
- **Thomas**, admitted C.C. 1632; master, 1656; 1651.
- **Thomas**, admitted C.C. 1658.
- **Lewis**, admitted C.C. 1699.
- **John**, 5, Bishopsgate Without, 1765-75.
- **Thos.**, 167, Fleet St., 1815-18.
- Hollidaie, Edwd.**, freeman of C.C. and signed petition in its favour, 1656.
- Hollier, Jonathan**, Skinner St., liveryman C.C. 1776. (See Houlliere.)
- Holloway, Robert**, C.C. 1632.
- **Edward**, admitted C.C. 1650.
- **William**, Cullum St., admitted C.C. 1697.
- Holm, Jno.**, Lancaster, 1783.
- Holmden, John**, musical clockmaker, 18, St. James' Walk, 1806; 50, King St., Goswell Rd., 1840. Livery C.C. 1807.
- Holmes, John**, admitted C.C. 1697.
- **John**, 156, Strand, near Somerset House, one of the experts appointed by the select committee of the House of Commons in 1763 to report on Mudge's timekeepers. In 1779 he made a clock for Greenwich Hospital; 1763-1810.
- **Edward**, 9, Foster Lane, Cheap-side; 1783-94.
- **Wm.**, 12, Clerkenwell Green, 1783.
- **Wm.**, 156, Strand, 1810-12.
- **Matthew Steel**, 10, Shoemaker's Row, Blackfriars, 1822-42; livery C.C. 1825.
- Holoway, Jo.**, Newbery; watch, with sun and moon hour indicators, 1680 (see p. 143).
- Holt, Lancaster**; Thos., 1747; Wm., 1767.
- Holtham, Geo.**, London; watch, 1720.
- Hone, Rt.**, London; watch, 1750.
- Honeybone, Thomas**, Old Brentford, 1830-40.
- Honison, J.**, Wilderness Row, and 5, Charlton Place, Islington, 1835.
- Hooke, A.**; silver gilt watch in the Fellows collection at the B.M., inscribed, "A. Hooke, 1661."
- **Robert**, born 1633, died 1703; invented the balance spring for watches and the anchor escapement for clocks (see p. 199).
- **John**, admitted C.C. 1698.
- Holtzman, Johannis**; in Wienns, in the Schloss collection, is a watch invented by him about 1775, in

- which the dial is raised above the movement, the hands being driven through a tube, p. 151.
- Hood, Jas.**, London; watch, 1805.
- Hooker, Jas.**, 22, Five Fields Row, Chelsea; card B.M. 1791.
- Hope, Edward**, Bridge St., Strand, 1775; 97, Oxford St., 1783-85.
- **Chas.**, London, 1820.
- **Geo.**, London; watch, 1825.
- Hopetown, Wm.**, London; watch, 1822.
- Hopgood, T. B.**, 202, Bishopsgate Without, 1823.
- Hopkins, John**, admitted C.C. 1641.
- **John**, Fleet St., 1753-56.
- **A. B.**, 32, Aldgate, 1823.
- **Edwd.**, 48, King St., Soho, 1817.
- Hornblower, William**, admitted C.C. 1713; maker of a long-case clock, Japanese decoration, arch dial, style about 1740.
- **William H.** (possibly a son of William), was beadle of C.C. 1779.
- **Wm.**, 9, Powell St., King's Sq., 1842.
- Hornby**, —, London; watch, 1825.
- Horne, Samuel**, admitted C.C. 1654; master, 1672-73.
- **George Henry**, C.C. 1718.
- **Henry**, master C.C. 1750-68.
- **William**, 114, Ratcliffe Highway, 1835-42.
- Horseman, Stephen**, was apprenticed to Daniel Quare, 1702, admitted C.C. 1709; Quare, prior to his death, seems to have taken Horseman into partnership, judging from examples with their joint names, including repeating and clock watches, and a thirty-day clock, 1724-40.
- Horstmann, Gustave**, inventor of perpetual clock (see p. 265); died at Bath, 1893, aged 66.
- Hoskins and Bird**, 11, St. John's Sq., Clerkenwell, 1822-30.
- **Jonah**, 6, Hatton Garden, 1840.
- **George**, 75, Old Broad St., 1842.
- Houghman, Charles**, C.C. 1680.
- Houghton, Richard**, C.C. 1690.
- **James**, 198, Tooley St., 1790-94.
- **James**, Ormskirk, assistant of William Garrat, and afterwards maker of watches with Debaufre's dead-beat escapement, with two escape wheels as modified by Sully, known in Lancashire as the club-footed verge, 1800-20.
- **John Handsworth**, Birmingham; a well-known clockmaker, 1798-1842.
- **Wm.**, Lever St., died 1890, aged 75.
- Houllgatt**, —; oval watch, S.K.M., inscribed, "W. Houllgatt, att Ipswich," about 1640.
- Houlhere**, —, "Jona Houlhere at the sign of the spring clock in Broad St., London," watch paper; Ponsonby collection, about 1760. (See HOLLIER.)
- Houriet, Frederick**, Locle; clever horologist and maker of spherical balance springs, 1810-25.
- House, J.**, Gray's Inn Lane; maker of a pair-case silver verge, showing day and night by means of a revolving plate, serving as hour hand, minutes shown in the usual way, period 1700; 1672-1700.
- **Robert**, 32, Upper Moorfields, 1790.
- Houseman, Jacob**, Lancaster, 1732.
- How, Benjamin**, admitted C.C. 1691.
- **William**, elected assistant C.C., but excused, 1697.
- **and Masterman**, White Hart Court, Gracechurch St., 1750-60.
- Howard, John**, admitted C.C. 1694.
- **Richard**, admitted C.C. 1718.
- **Wm.**; repaired the clock at Exeter Cathedral, 1760 (see p. 34).
- **Wm.**, London; watch, h.m. 1777.
- **H. and M.**, London; watch, steel index disc, 1792.
- **John Jarvis**, 68, Aldersgate St., 1790-94.
- **Edwd.**, 6, Kirby St., Hatton Garden, 1775-1804.
- Howe, Samuel**, admitted C.C. 1712.
- **Ephraim**, apprenticed to Graham, admitted C.C. 1729.
- **Samuel**, 173, High Holborn, 1840.
- Howell, Benjamin**, C.C. 1699.
- **Joseph**, admitted C.C. 1721.
- **John**, Bull's Head Court, Newgate St., admitted C.C. 1724; 1724-30.
- **Stephen**, London; watch, 1770.
- **Geo.**, London; watch, 1785.
- Howells, William**, Kennington, one of the experts appointed by the select committee of the House of Commons to examine Mudge's timekeepers, 1780-1810.
- Howes, Jno.**, C.C. 1672.
- **Jos.**, London; watch, 1770.
- Howlett, John**, London, known as a maker of good watches, about 1750; a specimen in a gold *repoussé* case, Schloss collection, about 1770 (see p. 127).
- Hows, Thomas**, The Sun, Pope's Head Alley; admitted C.C. 1632; known as a maker of watches, 1630-40.
- Howse, John**, Croydon, C.C. 1687.
- **Joseph**, 1698. See Howes.
- **John**, admitted C.C. 1706.
- **William**, 13, Fleet St., admitted C.C. 1731; master 1777; 1731-80.

- Howse, Charles**, 5, Great Tower St., master C.C. 1787; 1768-94.
- Hobson, John**, admitted C.C. 1699.
- Huand le Puisné** excelled as a figure painter in enamel for watch cases, about 1650.
- Hubbard, John**, admitted C.C. 1722.
- **Joseph**, watch gold hand maker, St. John's Sq., 1790.
- **E.**, musical clockmaker, 33, Gibson St., Waterloo Rd., 1840.
- Hubberd, C.**, watch-case maker, 9, Peerless Row, City Rd., 1835.
- Hubert, Estienne**, Rouen, maker of a watch said to have belonged to Mary Queen of Scots. In 1657 John Smith was fined 10s. for putting the name of Estinne Hubert on a watch; alarum watch in pierced and engraved silver case with inscription Estinne Hubert à Rouen S.K.M., about 1610. "Lost upon New-years-day, above stairs in Whitehall, a gold watch with a plain shapen case; the watch was made at Rouen, maker's name Hubert. Whoever brings it to her Royal Highness the Princess of Denmark's porter at the Cockpit, shall have two guineas reward" (*Lond. Gaz.*, Jan. 2, 1689).
- **Jean**, Rouen, maker of an oval silver watch, about 1650.
- **Noel**, Rouen, oval watch S.K.M., about 1620.
- **Estinne l'aine**, Amsterdam; repeating watch, about 1690.
- **James**. Charlotte Hubert was apprenticed to him and Elizabeth his wife in 1725; and in 1730 Catherine Cext was also apprenticed to them.
- **David**, Strand, master C.C. 1743; maker of a repeating watch, silver case engraved and pierced, enamel dial, Roman hour numerals, Arabic figures outside for minutes, the plate covered with engraving, and inscribed "Dav. Hubert, London." Mr. Evan Roberts has a repeating watch by him which sounds the minutes, and is therefore an early specimen of the kind. Another specimen of his work is a bracket clock repeating the quarters on six bells by pulling a cord, which winds up the quarter repeating train, brass arched dial, strike-silent, day of the month, verge escapement; 1735-48.
- Huchason, Richard**, C.C. 1702.
- Hudson, John**, St. Martin's Churchyard, 1780-85.
- **William**, Griffin St., Shadwell, 1835.
- Hues, Pierry (Peter)**, admitted C.C. 1632; 1660.
- Huges, Jno.**, Maidstone; lantern clock, about 1710.
- Huggerford, Ignatius**, admitted C.C. 1671; a watch by him played a prominent part in respect of the petition of Facio and Debaufre for extension of their watch jewel patent (see p. 351), 1671-1705.
- Hughes, John**, admitted C.C. 1703. (See Huges.)
- **Thomas**, admitted C.C. 1712.
- **S.**, Gracechurch St., 1774.
- **William**, 119, High Holborn, hon. freeman C.C. 1781; centre seconds watch by him in the Guildhall Museum; four of Earnshaw's watches with his name thereon were deposited for trial at Greenwich Observatory in 1791; small enamelled watch, Schloss collection, about 1790, (see p. 125); Mr. Henry Levy has a fine travelling watch by him from the Summer Palace, Pekin; it is in pair-cases 7 inches in diameter, chimes on six bells and sets in motion mechanical figures, 1769-94.
- **Thomas**, 25, Broad St. Buildings, master C.C. 1765; first liveryman, 1776; 1750-83.
- **John**, 92, Minories, 1800.
- **David**, 30, Frith St., 1835-42.
- Huguenin, A.**, 67, Great Russell St., 1830-42.
- Hulbert, William**, Castle Green, Bristol, 1708.
- Hull**, —, a celebrated cylinder escapement maker, who worked for Ellicott and other celebrated manufacturers. 1750-90.
- Hulme, Jas.**, 11, Bow St., 1817.
- Hulst, Jacob**, admitted C.C. 1646.
- Hulton, John**, admitted C.C. 1724.
- Humber, Thos.**, London; long-case clock, about 1790.
- Hume, Chas.**, London; watch, 1830.
- Humphrey, W. H.**, 17, Great Surrey St., 1830-35.
- Humphreys, Samuel**, C.C. 1728.
- Humphries, J.**, London, known as a maker of mantel clocks, about 1750.
- Humphrys, William**, C.C. 1699.
- **Wm.**; watch, about 1790.
- Hunot, Sam.**, 28, Rathbone Place, 1842.
- Hunt, John**, admitted C.C. 1671.
- **Edward**, admitted C.C. 1684; maker of a watch movement with tulippillars, in the Guildhall Museum. "Lost the 17th past, out of Mrs. Man's Lodgings in Soho, a gold minute pendulum watch, with a gold-studded case, the inward box marked E.H.

- and a coronet, made by Edw. Hunt" (*Lond. Gaz.*, September 15, 1692); 1684-1700.
- Hunt**, —, long-case clock, square dial, cherub corners, inscribed "Rich: Hunt, Bristoll," about 1700.
- **James**, admitted C.C. 1708.
- **William**, Ludgate St., 1753-56.
- **Jas.**, 5, King St., Cheapside, 1772.
- **Hiram**, Robbinston, Maine, U.S.A.; was said to have been the original "Sam Slick" of Haliburton. He died at an advanced age in 1886.
- **Thos.**, 151, Tottenham Court Rd., 1835.
- **Wm.**, Stafford St., Bond St., 1835.
- **Saml.**, Buttesland St., Hoxton, 1842.
- Hunter, Thomas**, 43, Lombard St., 1754; 156, Fenchurch St., 1763; liveryman C.C. 1768; 1754-94.
- **Thomas, Junior**, 156, Fenchurch St., 1781-1800.
- **William**, 51, Lombard St., 1766-94.
- **Thomas**, 54, Goswell Rd., 1788-94.
- **Wm.**, 156, Fenchurch St., 1804.
- **and Son**, 156, Fenchurch St., 1810-17.
- **J.**, Clapham; watch, 1815.
- **and Edwards**, 43, Cornhill, 1840-42.
- Huon, Jacques**, Paris, maker of a splendidly enamelled watch in S.K.M., about 1650.
- Hurland, Henry**, admitted C.C. 1654.
- Hurley, Isaac**, 68, Red Lion St., Clerkenwell, 1790.
- Hurst, Isaac**, admitted C.C. 1677.
- **W.** (M.?), 9, Lambeth Walk, 1835-42.
- Hurt, Henry**, Ludgate Hill, 1750-56.
- Hussey, Joseph**, admitted C.C. 1685.
- Hutchin, Joshua**, admitted C.C. 1682.
- In the B.M. is a watch by him, handsome silver dial with a semicircular slit above the centre, through which appears blue sky, the sun in the day and the moon at night pointing to the hour; 1670-1700.
- **Joseph**, admitted C.C. 1697.
- **Joseph**, admitted C.C. 1703.
- **John**, admitted C.C. 1703.
- Hutchinson, John**, petitioned Parliament to grant a longer period than usually covered by a patent for his improved watch, which would be wound without any aperture in the case. Successfully opposed by C.C., Mr. Charles Goode producing to the Committee of the House of Commons a watch made fourteen years previously, which Mr. Hutchinson confessed was made as his; 1712.
- Hutchinson, Jno.**, London; watch, 1825.
- **Richard**, C.C. 1702-36.
- Hutton, Jos.**, London; watch, 1750.
- **Patrick**, 83, Cannon St., 1790.
- **Thos.**, London; mentioned by Earnshaw 1776.
- **John**, chronometer maker, Commercial Rd., E., 1830; Mark Lane, 1830-68.
- Hux, Thos.**, London; watch, 1825.
- **John**, 41, Percival St., 1840-42.
- **R. R.**, Spencer St., Clerkenwell, a well-known maker; died 1869.
- Hyams, Joshua**, 32, Leman St., Goodman's Fields, 1840-42.
- Hyde, Thomas**, 33, Gutter Lane, 1783-94.
- **James**, 38, Gutter Lane, 1783.
- Hyland, Jno.**, London; watch, 1770.
- Hynam**, —, horloger de la Cour St. Petersburg, on a quarter clock, about 1750.
- **Robert**, 4, Clement's Lane, liveryman C.C. 1769-80.
- Hyon**, à Paris, on a watch, S.K.M., about 1740.
- Ibel, Thomas**, watch-spring maker, Featherstone St., 1790.
- Illbury, Wm.**, Duncan Terrace, died 1851; a well-known manufacturer of fine enamelled and other watches for the Chinese market during the early part of this century.
- Imhof, N.**, 24, Curtain Rd., 1842.
- Imison**, —, London; watch, h.m. 1786.
- Inglish, Jas.**, 36, Watling St., 1790.
- **Adam**, wooden clockmaker, 39, St. John's Sq., 1840.
- Ingold, Pierre Frederick**, born at Bienne, 1787, a clever mechanic, who devised machinery for duplicating parts of watches. He visited Paris about 1830. In 1841 he was in London; in 1842 and 1843 he took out various patents for protecting the tools to be used by the British Watch Company; visited New York in 1845, and afterwards returned to Switzerland; died 1878.
- Ingram, Thomas**, admitted C.C. 1695.
- **William**, admitted C.C. 1730.
- **William**, 40, Goswell St., 1842.
- Inkpen, John**, Horsham, maker of long-case clocks, about 1770.
- Innes, R.**, London; watch, 1760.
- Innocent, Robt.**, 16, Gwynn's Place, Hackney Rd., 1835.
- Inwood, S.**, London; watch, green leather case piqué, about 1700; another case exhibited at the Guelph Exhibition by Mr. Geo. Carr Glyn.

- Ireland, Henry**, Lothbury; admitted C.C. 1654; maker of lantern clocks, 1650-75.
- **Francis**, admitted C.C. 1668.
- **John**, 21, Maiden Lane, 1779.
- Ironside and Belchier**, Lombard St., 1737-40.
- Irvin, Jean**, 32, Kirby St., Hatton Garden, 1825.
- Irvine, J.**, watch-movement maker, 23, Rahere Street, 1835.
- Irving, Alexander**, C.C. 1695.
- Isaac, Daniel**, assistant C.C. 1670; 1660-70.
- Isaacs, Levy**, 57, Mansell St., 1769-83.
- **Lewis**, 23, Houndsditch, 1830-42.
- Israel, John**, 180, Whitechapel, 1783.
- Ive, G. H.**, 10, Finsbury Place, 1825; also at 17, Cornhill, 1826-42.
- Ivery, John**, repairer of the clock of St. Margaret's, Westminster, 1548.
- Ives, Francis**, admitted C.C. 1790; maker of a thirty-hour clock, hour hand only, inscribed "Fra. Ives, fecit for Thos. Sclater, Gentl."
- Izod, William**, admitted C.C. 1649.
- Jaccard, J.**, 60, Red Lion St., Clerkenwell, 1820-22.
- **David**, 26, Percival St., 1840-42.
- Jackman, Joseph**, "On London Brydgc," maker of a large verge watch movement in the Guildhall Museum, period about 1690.
- Jackson, Richard**, C.C. 1632.
- **Joseph**, admitted C.C. 1648.
- **Edward**, admitted C.C. 1669.
- **Edward**, Newington, Surrey, 1677; admitted C.C. 1680.
- **John**, admitted C.C. 1682.
- **Thomas**, admitted C.C. 1688.
- **James**, admitted C.C. 1689.
- **Matthew**, admitted C.C. 1730.
- **Martin**, admitted C.C. 1697, master, 1721; maker of a bell-top ebony case, pull-repeater clock, brass arch dial, 1697-1721.
- **John**, 37, Basinghall St., 1759-74.
- **William**, Broad St., afterwards Tower St.; liveryman C.C. 1776; known as a maker of long-case clocks, 1740-76.
- **Randal**, 8, Chapel Row, Spa Fields, 1780.
- **John**, 2, Bridgewater Sq., livery C.C. 1776, master, 1796; 1769-1800.
- **John, Junior**, Bridgewater Sq., master C.C. 1822; 1800-30.
- **Henry**, 29, St. Martin's Lane, 1790-94.
- **Thomas**, 52, Upper East Smithfield, 1790; 53, Red Lion St., Clerkenwell, 1810.
- Jackson, Lancaster**; **Wm.**, 1801; **Wm. W.**, 1817.
- **Isaac**, 145, St. John's St., 1804.
- **W.**, 31, Cowcross St., 1820.
- **Geo.**, 82, Charlotte St., Rathbone Place, 1815-25.
- **John**, watch-case maker, 10, Norman St., St. Luke's, 1835.
- **William**, 6, Brunswick Place, Brompton, 1835-42.
- **Henry, and Son**, 66, Red Lion St., Clerkenwell, 1835-42.
- **William**, 29, Exeter St., Sloane St., 1835.
- **John**, 72, Hackney Rd., 1842.
- Jacob, Benjamin**, admitted C.C. 1706.
- **Benjamin**, admitted C.C. 1718.
- **Dennis**, Cockspur St., 1775-1800.
- **Dan.**, 57, Margaret St., 1817.
- Jacobs, Jean**, Harlem; octagonal watch, dated 1560.
- **Judah**, Whitecross St., 1769; 1, Little Mitre Court, Fenchurch St., 1771. Mr. Thos. Boynton has a bracket clock by him, brass and silvered dial, mahogany case.
- **E.**, 86, York St., Westminster, 1820; 25, Bevis Marks, 1825-35.
- **Edward**, 29, Earl St., Westminster, 1835.
- Jacques.** (See Jaques.)
- Jaggard, Edward**, admitted C.C. 1702.
- Jakeman.** — (See Jackman.)
- James, John**, admitted C.C. 1662.
- **Joseph**, admitted C.C. 1689.
- **Robert**, 23, White St., Borough, 1835.
- Jamison, George**, 33, Charing Cross, 1800-5. In conjunction with Howells and Barraud he completed chronometers on Mudge's plan; he also attested the value of Earnshaw's improvements in 1804.
- Jammett.** —, admitted C.C. 1704.
- Janaway, Jno.**, 114, Cheapside, 1815.
- Janvier, Antide**, born 1751 at St. Claude in the Jura, settled in Besançon, and became an authority on horological construction. His "Essai sur les Horloges" was published at Paris in 1811; died 1835.
- Japy, Frederic**, Beaumont, France; born 1749, died 1812; in 1799 he patented a series of machines for producing parts of watches by unskilled labour. This appears to be the first attempt to manufacture watches on the factory system.
- Jaques, William**, admitted C.C. 1687; master 1716.
- **William**, C.C. 1724.
- **Aug.**, 4, President St., 1842.
- Jaquet, Peter**, London; watch, 1782.

Jardin, John, Bartholomew Close, one of the witnesses in the will of Christopher Pinchbeck the younger in 1780; admitted hon. freeman C.C. 1781; maker of a repeating watch in shagreen case, style 1745; 1745-81.

Jarman, John, admitted C.C. 1728.

— **John B.**, 25, Strand, 1815-23.

— **and Co.**, 33, St. James' St., 1825.

Jarrett, Richard, London; watch by him, Schloss collection, about 1665 (see p. 137); master C.C. 1685; 1660-86.

— **Barnard**, City Rd., livery C.C. 1786.

— **John W.**, livery C.C. 1786.

— **and Sons**, watch case engravers, Albemarle St., St. John's Sq., 1780-94.

Jarvis, George, admitted C.C. 1728.

— **John**, Aldersgate St., 1775-94.

Jayne, John, admitted C.C. 1687.

Jeanin, A., 28, Cranbourne St., 1842.

Jefferies, John, admitted C.C. 1639.

Jefferson, Samuel, 35, Bruton St., 1805-42.

— **and Son**, 38, Fetter Lane, 1815.

— **Reed and Walton**, 38, Fetter Lane, 1820-25.

— **Matthew**, 236, High St. Shadwell, 1835-42.

Jeffery William Knight, C.C. 1712.

— **Thomas, and Jones**, Cockspur St., Charing Cross, 1769-94.

Jefferys, Nathaniel, Strand, 1771. (See Drury Dru.)

— **Nathaniel, junior**, 70, Piccadilly, 1780-94.

— **Thomas**, Cockspur St., 1771.

— **Henry**, 96, Fleet St., 1793; 49, Salisbury Sq., 1798-1804.

— **G.**, 86, New Bond St., 1800.

— **and Gilbert**, Cockspur St., 1800.

— **Nathaniel**, 22, Queen St., Mayfair, 1768-1804.

— **and Ham**, 49, Salisbury Sq., Fleet St., 1810-15; 46, Skinner St., 1825.

Jeffreys, John, admitted C.C. 1726; to him was apprenticed Larcum Kendall in 1735.

Jefferies, John, admitted C.C. 1697.

— **Benjamin**, admitted C.C. 1702.

Jelf, William, admitted C.C. 1717.

Jenkins, Thomas, admitted C.C. 1678.

— **Cornelius**, admitted C.C. 1678.

— **James**, admitted C.C. 1692; fine month clock, arch dial, by him about 1700.

— **—**, Cheapside, 1774.

— **Henry**, 68, Aldersgate St., known as a maker of curious astronomical and other clocks, 1756-83 (see p. 248).

— **F.**, 7, Tyler St., Regent St., 1835.

Jenkinson, J., Sandwith; watch, 1770.

Jennings, Robert, C.C. 1703.

— **Thomas**, admitted C.C. 1721.

— **Charles**, admitted C.C. 1725.

Jernegan, Edward, Great Russell St., 1737-40; Featherstone Buildings, 1750-59.

Jerome, Chauncey, pupil of Eli Terry, maker of American clocks, 1800.

Jersey, Francis; bracket clock, about 1760.

Jessop, Josias, 38, Southampton St., Covent Garden, 1781-90.

Jeubi, Josias, Paris; watch about 1630.

Jevon, May, admitted C.C. 1706.

Job, W., London; watch, 1795.

— **Robert**, 25, Charlton St., Somers Town, 1835; 7, Park Terrace, Camden Town, 1842.

— **Fredk.**, 25, Sherrard St., Golden Sq., 1835; 17, Tichborne St., Haymarket, 1842.

Jodin, Jean, author of "Les Echappemens à repos comparés aux échappemens à recul," Paris, 1766.

Johann, A., author of "Traité Générale d'Horlogerie," born 1822.

John, Hans, Königsberg; maker of a curious watch, B.M., having attached a small wheel-lock pistol, supposed to have been used as an alarm, about 1650.

Johnson, Roger, petitioner for incorporation of C.C. 1630.

— **Jery**, Exchange Alley. In the B.M. is a small watch of his make in an irregular octagonal-shaped case with a faceted crystal over the dial, about 1650.

— **George**, admitted C.C. 1649.

— **John**, admitted C.C. 1678.

— **John**, admitted C.C. 1680.

— **Michael**, Barnard Castle; admitted C.C. 1687; watch by him about 1720.

— **John**, Fleet Lane, 1701.

— **Jeremiah**, Exchange Alley, C.C. 1668-90.

— **Cornelius**, admitted C.C. 1694.

— **Robert**, Edinburgh, apprenticed to Andrew Brown in 1696.

— **Thomas**, admitted C.C. 1700.

— **John**, admitted C.C. 1701.

— **Isaac**, C.C. 1705; watch by him 1720.

— **James**, admitted C.C. 1706.

— **Thomas**, admitted C.C. 1713.

— **Isaac**, admitted C.C. 1723.

— **William**, admitted C.C. 1702; maker of a bracket clock, bell-top ebony case, with handle, brass dial, bob pendulum, style 1725, strike-silent, 1703-25.

- Johnson, Thomas**, 9, Gray's Inn Passage, about 1730.
- **Peter**, Mitcham; watch, 1790.
- **James**, New Rd., St. George's East, 1790-94.
- **John**, 9, Gray's Inn Passage, 1770-99.
- **John**, 5, Elm St., Gray's Inn Lane, 1790-1820.
- **C.**, 7, Sweeting's Alley, 1820-23.
- **Richd.**, 18, Francis St., Bedford Sq., 1815-20.
- **Leond**, 19, Bartlett's Buildings, 1825.
- **J. and W.**, 19, Cross St., Hatton Garden, 1825.
- **James**, 18, Paddington St., 1835-42.
- **William**, 50, Strand, 1825-42.
- **and Co.**, London; repeating watch, 1830.
- **Edward Daniel**, 9, Wilmington Sq.; a leading watch manufacturer, formerly with James Stoddart; retired from business 1879; died at Highbury, 1889, aged 73.
- Johnston and Breicians**, London; watch, h.m. 1816.
- **G.**, 7, Queen St., Northampton Sq., 1835.
- **J.**, 2, Elm St., Gray's Inn Lane, 1835.
- **Jno.**, Glasgow; patented a pedometer watch in 1840 (No. 8645).
- Jolly, J.**; watchmaker to the Paris Town Hall in 1550; worked also for Catherine de Medicis. A watch by J. Jolly, Paul Garnier collection (see p. 108). Skull watch (Soltyskoff collection) by Jacques Jolly, about 1650. Two watches by Joshua Jolly, Vienna Treasury, splendidly enamelled cases and dials, about 1670.
- **Joseph**, 11, Dean St., Fetter Lane, 1790-94.
- Joly, Jacques**, London; in the B.M. is a watch by him, 1620-30.
- Jon, J.**, London; lantern clock, arch dial, about 1730.
- Jones, Evan**, admitted C.C. 1648; signed petition, 1656, assistant, 1671.
- **William**, admitted C.C. 1663.
- **Thomas Wm.**, admitted C.C. 1679; very small watch by him, Schloss collection, gold dial, raised figures, outer case leather piqué; another with splendid pillars, balance spring, stud underneath plate.
- **Jonathan**, admitted C.C. 1687.
- **David**, admitted C.C. 1687.
- **Henry**, admitted C.C. 1697.
- **Valentine**, admitted C.C. 1704.
- **John**, admitted C.C. 1716.
- Jones, Henry**, Inner Temple Gate, master C.C. 1691; an eminent maker (see p. 170); 1663-93.
- **John**, master C.C. 1762; 1748-63.
- **Jenkin**, 61, St. James's St., 1775-83.
- **Owen**, Little George St., Minorities; livery C.C. 1786; 1780-94.
- **William**, livery C.C. 1786; 1778-86.
- **William**, 27, Barbican; livery C.C. 1786; 31, Little Moorfields, 1810; 1780-1810.
- **David**; watch-pendant maker, 69, Bunhill Row, 1790-94.
- **Robert**, 49, Little Bartholomew Close, 1800.
- **James**, 65, Banner St., 1795-1810.
- **Wm.**, White Cross St., 1810-15.
- **Jno.**, London; repeating watch, 1775.
- **John**, 338, Strand, 1821; succeeded by his son, John Jones, a man of high attainments and a successful manufacturer; vice-president of the British Horological Institute; he retired from business in 1885.
- **and Grant**, 123, New Bond St., 1815-18.
- **F.**, 62, Cornhill, 1825.
- **Sam.**, 78, Cheapside, 1820-25.
- **W.**, 132, Holborn Hill, 1825.
- **John and Timothy**, 20, Red Lion St., Clerkenwell, 1825-30.
- **Timothy**, 18, Ludgate St., 1826-40.
- Jordan**, —, Bristol; watch, silver cock, about 1700.
- **Timothy**, 40, Snow Hill; maker of a tall mahogany-case clock, brass dial, period 1780; 1769-80.
- Josephson**, —, London; many watches, Dutch style, 1760-90.
- Jourdain, A.**, 6, Wheeler St., Spitalfields, 1790-94.
- **William**, London; maker of a timepiece with crown wheel escapement, short pendulum with pear-shaped bob, and 8-inch silvered dial. Through a short circular slit in the upper part of the dial is shown a small silvered star, which, as it vibrates along with the pendulum, shows when the timepiece is going, about 1680; another example, watch, about 1710.
- Jourdain, R.**, 29, Marshall St., Golden Sq., 1835.
- Joyce, George**, admitted C.C. 1692.
- **Stephen**, Moor St., Soho, 1769.
- **Samuel and Co.**, 38, Lombard St., 1790-1842.
- **James**, Whitechurch, a well-known clockmaker, died 1883, aged 62.

- Joyne, Jno.**, St. Germain, Paris; watch, B.M., square case, crystal cover, 1690-1710.
- Judson, Thomas**; sent a letter to C.C. relative to watches seized, 1790.
- Julian, Gregory**, admitted C.C. 1664.
- Jullion, John**, Brentford, 1730.
- Jullion and Son**, New Brentford, 1771.
- Julliot, Solomon**, London, verge watch by him in the Guildhall Museum, date on mainspring 1738.
- Jurgensen, Urban**, born 1776, died 1830; an eminent Danish watchmaker. Author of "The Higher Horological Art" and "Principes de la Mesure du Temps." Jurgensen was associated with the leading men of his day. He experimented with compensation balances made of brass and platinum, and strongly advocated the use of gold springs for marine chronometers. He made many excellent chronometers for the Danish navy, and very successful metallic thermometers.
- **Louis Urban**, Copenhagen, son and successor of the foregoing; born 1790, died 1867.
- Just, Leonard**, St. John's Sq., 1790-1825; maker of watches for the Chinese market.
- **Leonard**, Myddelton Sq., 1830-42.
- **George**, 22, Anderson's Buildings, City Road, 1830-42. He made watches with movements wholly of steel, except the jewels and the bushes for the larger pivot holes, which were of gold; they were chiefly for the Chinese market; the pinion leaves wore into ruts quicker than if working with brass wheels.
- Justis and Comp**, Well Yard, St. Bartholomew's Hospital, 1769.
- Kaiser, Kleyser and Co.**, wooden clock-makers, 4, Broad St., 1840.
- Kaltenback and Fuller**, 77, Blackman St., 1834-42.
- Kammerer, Joseph**, wooden clock-maker, 51, King St., Borough, 1840.
- Kangiesser, S.**, 24, Southampton St., Strand, 1816-25.
- Kanns, John**, admitted C.C. 1712.
- Kater, Captain Henry, F.R.S.**, conducted experiments for determining the length of the seconds pendulum in the latitude of London, 1817.
- Kay, Jno.**, London; long-case chime clock, about 1750.
- Keal, Wm.**, London; watch, 1799.
- Keandler, Chas.**, Jermyn St., 1793.
- Keat (Kent?), Joseph**, 19, Cock Hill, Ratcliff, 1810.
- Keat, Edward**, 69, Banner St., St. Luke's, 1830-40.
- **Mrs. Mary Anne**, 19, Broad St., 1810.
- **Sophia**, 60, Banner St., 1842.
- Keates, Wm.**, 135, Fleet St., 1783-1800.
- Keating, A.**, 114, Strand, 1796-1815.
- Keddon, Daniel**, admitted C.C. 1717.
- Keef, Thomas**, 22, Rosoman St., Clerkenwell, 1835.
- Keeling, George**, musical clockmaker, Webber St., Blackfriars Rd., 1840.
- Keely, W.**, gilder, Orange Court, Clement's Lane, 1790-94.
- Keely, Jeremiah**, London; watch, 1800.
- Kefford, Thomas**, Royston, maker of lantern clock, about 1700; long Oriental lacquer-case clock, about 1720.
- Kehlhoff, Frederick**, St. George-the-Martyr, Southwark; patented in 1764 (No. 819) a centre-seconds going-barrel watch, with stackfreed and remontoire.
- Kellet, Thos.**, fined by C.C. for defective watch, 1635.
- Kelly, Richard**, Devereux Court, Strand; long Chippendale case clock, about 1790.
- Kelme**, —, London, maker of a small timepiece on a horse, in the Massey-Mainwaring collection, 1670.
- Kelton, Simon**, admitted C.C. 1723.
- Kemble, J. T.**, Knightsbridge, 1817.
- Kemp, Charles**, admitted C.C. 1688; Thos. Tompion, junr., apprenticed to him in 1694.
- **Richard**, admitted C.C. 1701.
- **William**, livery C.C. 1786.
- **Joseph**, Curtain Rd., 1790.
- Kemps, Matthew**, C.C. 1670.
- Kendall, Larcum**, born at Charlbury, Oxford, 1721; apprenticed in London to John Jeffreys, 1735; 20, Wood St., Cheapside, 1750; Furnival's Inn Court, 1765, when he was one of the judges appointed to report on Harrison's timekeeper. In 1766 he agreed to make a duplicate for the Commissioners of Longitude, undertaking to faithfully reproduce the various parts without being held responsible for the performance. The price was to be £450, and he stipulated that one half should be paid in advance. The date on this instrument is 1769. But it was in January, 1770, that he addressed a letter to the Committee desiring them to inspect it. Kendall afterwards made a much simpler instrument than Harrison's, without the remontoire action, and with an ordinary seconds hand; the

- date on this is 1771. It was presented to the United Service Institution by Rear-Admiral Sir Thomas Herbert, K.C.B., in 1854, when this inscription was engraved on it by Messrs. Lambert: "This Timekeeper belonged to Captain Cook, R.N., and was taken by him to the Pacific, 1776. It was again taken to the Pacific by Captain Bligh in the *Bounty*, 1787. It was taken by the mutineers to Pitcairns Island, and was sold, 1808, by Adams to a citizen of the United States, who sold it at Chili, where it was purchased by Sir Thomas Herbert." There is a fine watch with a remontoire escapement by him in the Guildhall Museum. He died in 1795. In his indentures and his correspondence with the Board of Longitude his name is spelt Kendall, yet curiously enough, on his chronometer at Greenwich Observatory, it is "Kendal."
- Kendall**, —, watch finisher, 17, St. John's Sq., 1790-94.
- Kendrick, John**, admitted C.C. 1719.
- **John**, admitted C.C. 1726.
- **Wm.**, 36, Lombard St., 1772.
- Keney, Vincent**, received £19 16s. 8d. from Henry VIII. for "xj clocks and dials," 1530.
- Kenney, William**, threatened with prosecution by C.C. for exercising the art, not being admitted, 1682.
- Kenning, Wm.**, admitted C.C. 1684.
- **Edwin**, London; lantern clock, about 1705.
- Kent, Henry**, Westminster, C.C. 1650.
- **Joseph**, 19, Cock Hill, Ratcliff, 1806-17.
- **John**, 19, Broad St., Ratcliff, 1817-35.
- Kentish, John**, Pope's Head Alley, 1758-61.
- **John**, and **Haynes**, 18, Cornhill, 1769-88.
- Kenton, Joseph**, admitted C.C. 1686.
- Kerby, Thomas F.**, London, known as a maker of clocks about 1760.
- Kershaw, George**, Tyler's Court, Carnaby Market, 1790-94.
- Kersill, William**, 21, Aldersgate St., 1775.
- Kettle, G.**, London; watch, 1795.
- Keys, David**, Craven St., Strand, a well-known manufacturer of watches, died 1887, aged 74.
- Keyzor, Louis**, 16, Tottenham Court Rd., 1835-40.
- Kiblich, Matthew**, Presburg; watch by him Vienna Treasury, oval white enamel case ornamented with flowers, bezel encrusted with brilliants and emeralds, about 1715.
- Kidd, Gilbert**, Malton, 1760-80.
- Kidder, John**, 6, Strand, 1816-23.
- Killingworth, Jno.**, 200, Brick Lane, Spitalfields, 1815-18.
- Kilminster, Henry**, C.C. 1677.
- Kimbell, Thomas**, 214, Tottenham Court Rd., 1842.
- Kinable**, —, lyre clock (see p. 280).
- King, Jonathan**, admitted C.C. 1689.
- **Thomas**, admitted C.C. 1669; maker of a marqueterie long-case square dial clock, 1669-90.
- King, Nehemiah**, lantern clock, Mr. C. H. Read, dated 1693.
- **John**, admitted C.C. 1715.
- **John**, admitted C.C. 1729.
- **Isaac**, Moorfields, 1730.
- **William John**, admitted C.C. 1720. In the B.M. is a watch by him with *repoussé* case, 1730; another example, a repeating watch, 1745.
- **Henry**, Lincoln's Inn, admitted C.C. 1720; watch, gold *repoussé* case, Schloss collection; 1720-45.
- **John**, Gough Sq., 1758-61.
- **Thomas**, Alnwick, 1773.
- **Thomas and Benjamin**, 82, Upper East Smithfield, 1804-25.
- **W.**, 34, High Holborn, 1822-30.
- **Thomas**, 130, Minorities, 1835-42.
- Kingman, James**, 104, Leadenhall St., 1783.
- Kingsmill, George**, C.C. 1667.
- Kinnear, Charles**, 33, Frith St., 1830.
- Kinning, John**, admitted C.C. 1701; watch, encased in glass, B.M. 1700-30.
- Kipling, William**, Broad Street, near Ratcliff Cross, maker of oak long-case clock, square dial, period Queen Anne, also a watch, h.m. 1730. Another example, bracket clock, brass arched dial, strike silent, day of month, elaborately inlaid case of hard wood, prolongation of pendulum seen through arc slot in dial. Brought from the Emperor's Summer Palace at Peking, 1860; had then crown escapement, and was a "pull repeater" with eight very sweet bells; engraved back plate, 1705-37; "Wm. and Jno. Kipling, London," on clocks about 1750.
- Kirby, Robert**, admitted C.C. 1722.
- **Charles**, London; watch, 1795.
- Kirk, John**, admitted C.C. 1677.
- Kirkton, R.**, enameller, Red Lion St., 1790.
- Kirnier and Kleyser**, 14, Oxford St.; card B.M. 1791.

Kissor, Samuel, admitted C.C. 1712.
Kitchen, B., 32, Compton St., 1842.
Kitching, Joshua, 14, Dover St., Piccadilly, 1816-23.
Klaftenberger, C. J., 157, Regent St., a skilful watchmaker, sometime vice-president of the Horological Institute; died 1874, aged 79.
Kleyser, Jno., wooden clock maker, 191, High Holborn, 1790-94.
 — **George and Co.**, wooden clock-makers, 3, Little Tower Hill, 1790-94.
 — **and Kaltenback**, wooden case-maker, 196, High St., Borough, 1810-25.
 — **and Fritschler**, 405, Oxford St., 1835-42.
 — **T. and J.**, 191, High Holborn, 1810-30.
 — **J. and Co.**, wooden case-maker, 4, Goswell St., 1840.
 — **John**, wooden case-maker, 66, Borough High St., 1840.
Kneller, Johann Michael; watch B.M., square brass case with silver filagree overlay, 1630-40.
Knibb, Samuel, admitted C.C. 1663.
 — **Joseph**, Oxon., admitted C.C. 1670 (see p. 203).
 — **Peter**, admitted C.C. 1677.
 — **John**, Oxon., maker of a verge watch movement, with curiously wrought pillars, in the Guildhall Museum, style 1690.
Knifeton, Thomas, at Ye Cross Keys, in Lothebury, 1690-1700.
Knight, Michael, apprenticed to Tompion, admitted C.C. 1677.
 — **Richard**, admitted C.C. 1682.
 — **Charles**, Flower-de-luce, Great Russell St., C.C. 1685-97.
 — **Henry**, admitted C.C. 1723.
 — **John**, 6, Carpenters' Buildings, London Wall, 1768.
 — **Benjamin**, New St., Dockhead, 1790.
 — **Valentine**, gold dial maker and engine turner, Newcastle Place; first president of the British Horological Institute; born 1793, died 1867.
Knottesford, William, admitted C.C. 1664; master, 1693; maker of a circular silver watch in the B.M., also of a repeater in S.K.M., h.m. 1684; and a large clock-watch in the Guildhall Museum; 1650-95.
Knowles, James, 2, Hospital Row, Chelsea, 1835-40.
Kotte, Jacob; antique watch, Shandon collection, about 1630.
Kover, —; handsome watch, gold *re-poussé* case, about 1720.

Kreizer, Conrad, watch in the form of a cross, Vienna Treasury, case of crystal, dial of silver, dial of gold, with instruments of the Passion engraved thereon, about 1600; octagonal watch by him, S.K.M., about 1610.
Krenckel, Peter, Eüchstet (or Füchstet); alarum table clock belonging to Major W. J. Myers, S.K.M., about 1700.
Kullberg, Victor, born at Gothland, Sweden, 1824. In 1851 he came to London, where he died in 1890. One of the most brilliant and successful horologists of the present century. Inventor of a compensation balance with flat rim.
Kyezor, Louis, 46A, Edgware Rd., 16, Tottenham Court Rd., and 3, Great Turnstile, 1842.
Kynvyn, Jonas, maker of a clock belonging to the Earl of Essex, 1593.
Lacey, Chas., 12, Ludgate St., 1783.
Lacon, Peter, London; watch, 1785.
Lacour, Daniel, New St., Covent Garden, 1825.
Ladd, Ladd, admitted C.C. 1709.
 — **J.**, 35, Cornhill, 1823.
Lafons. (See De Lafons.)
Lafosse, Wm., 32, Old Broad St., 1738-94.
Laidlaw, Thomas, 16, Salisbury Sq., 1770-94; hon. freeman C.C. 1781.
Lainy, David, maker of a watch in the Guildhall Museum, about 1670.
 — **John**, admitted C.C. 1720.
Laisne, Sibelin, Neuchatel, about 1750.
Lake, Bryan, admitted C.C. 1674.
Lamb or Lambe. Several generations beginning with Thomas Lambe, 1630. In 1704 it was reported to the C.C. that among other well-known makers the name of Lamb had been engraved on watches by persons in Amsterdam, which watches were sold as of English make.
Lamb, Thos., Union St., Spitalfields, 1790.
 — **Benj.**, 21, St. John's Sq., 1769-79.
 — **and Webb**, 21, St. John's Sq., Clerkenwell, 1780-95.
 — **Sarah**, 2, Lower Queen's Row, Pentonville, 1842.
Lambe, Thomas, admitted C.C. 1632.
 — **Edmund**, admitted C.C. 1675.
 — **John**, 29, Fetter Lane, 1800.
Lambert, Nicholas, London, 1750-70.
 — **Jas.**, London; watch, 1760.
 — **John**, 2, Tichborne St., 1775-1810.
 — **Francis**, partner with Hamlet in 1800; afterwards started business

- at 12, Coventry St., and subsequently entered into partnership with Rawlings at the same address.
- Lambert, Henry**, 93, Piccadilly, 1840.
- **Henry**, 119, Cheapside, 1842.
- Lampe, John**, Henrietta St., admitted C.C. 1713; Chippendale long-case clock, large hood and gallery round the top, inscription on disc, "John Lampe, London;" 1713-65.
- Lamport**, —, Bow St., Bloomsbury; watch, h.m. 1810.
- Lamude, Reu.**, Chard; watch, 1760.
- Lancaster, Francis**, London; a good workman, 1790-1800.
- Landlen, Thomas**, 16, Salisbury Court, 1794.
- Lane, Geo.**, 185, High Holborn, 1893.
- Langcroft, Richard**, C.C. 1718.
- L'Ange, A.**, 51, Cornhill, 1835.
- Lange, Adolf Ferdinand**, apprentice of Winnerl, Paris; an excellent and progressive watchmaker; Glashutte, Saxony; died 1873, aged 60.
- Langford, Goring**, admitted C.C. 1652.
- **Thos.**, hon. freeman C.C. 1781.
- Langhorne, Thomas**, Threadneedle St., liveryman C.C. 1776.
- Langley, Thomas**, admitted C.C. 1664.
- **Cornelius**, admitted C.C. 1708.
- Larard, Jas.**, 7, New Bridge St., 1842.
- Larcay**, —, an eminent French horologist, period 1725.
- Large, Augustus**, 51, Cornhill, 1840.
- **Jonathan**, London; long-case clocks, about 1790.
- Laroch, John**, 18, High St., Bloomsbury, 1815-25.
- Lasarus, Abraham**, Gun Yard, 1760-65.
- Lashbrook, Henry**, C.C. 1715.
- Lasoffe, William**, 52, Old Broad St., 1765-70.
- Lasseter, William**, Arundel; maker of long-case clocks, about 1770.
- Latham, John**, admitted C.C. 1700; maker of a watch with gold *repoussé* case, in S.K.M., 1720.
- **T.**, London; watch, 1795.
- Latour, René**, admitted C.C. 1730.
- Lauriere, J.**, 62, St. James's St., 1822-30.
- Laver, Benjamin**, 4, Bruton St., Berkeley Sq., 1790-1800.
- Law, Thomas**, 27, Thomas St., Southwark, 1790-94.
- **Anthony**, 68, Borough High St., 1840-42.
- Lawe**, —; forbidden to work by C.C. 1632.
- Lawell, Paul**, admitted C.C. 1653.
- Lawley, Bernhard**, 253, Borough High St., 1840-42.
- Lawrence**, —, Lancaster; Jno. 1761; Wm. 1785.
- , —, Bath, 1763.
- **James**, 13, Bolingbroke Row, Walworth Rd., 1835.
- **G.**, 74, Paradise St., Rotherhithe, 1835-42.
- **and Son**, 171, Tooley St., 1835.
- Lawriere, Jno.**, 13, St. James's St., Pall Mall, 1815-19.
- Lawson, Jno.**, London; watch, 1763.
- **John Edwd.**, 58, Bishopsgate Within, 1800-25; livery C.C. 1812.
- Lawton, Thos.**, London; watch, 1820.
- Laxton, Thomas**, admitted C.C. 1642.
- **Thomas**, admitted C.C. 1653.
- Layfield, Robt.**, Lancaster, 1785.
- Layton, John**, admitted C.C. 1653.
- **Francis**, admitted C.C. 1726.
- **Thomas**, Dean St., liveryman C.C. 1776; 82, Wardour St., 1794-1823.
- Lazare**, —, a Servian; made a clock for Moscow, 1404.
- Lazarus, H.**, 112, Upper East Smithfield, 1815.
- **J.**, 15, Carter St., Houndsditch, 1825; 39, Minories, 1830.
- **J.**, 13, Oakley St., Lambeth, 1835.
- **H. L.**, 3, Bury St., St. Mary Axe, 1835.
- **E.**, and **Son**, 3, Bury St., St. Mary Axe, 1840-42.
- Lazenby, R.**, Knightsbridge; on a small clock, with sunk seconds and day of the month circles, about 1770.
- **Wm.**, Paradise Row, Chelsea; card, B.M. 1784.
- Lea, Thomas**, Old Jewry, livery C.C. 1766; master, 1782; 1760-83.
- Leach, Thos.**, Lombard St., 1753-60.
- Leadbetter, William**, Cross Keys Court, Little Britain, 1785-94.
- Leah, Samuel Henry**, 29, Bath St., City Rd., 1823-42.
- **Sam. Hy., jun.**, Mare St., Hackney, 1835; 79, Shoreditch, 1842.
- Leake, Faith**, admitted C.C. 1685.
- **George**, admitted C.C. 1693.
- Leaver, Wm.**, 45, Gt. Sutton St., 1822-30.
- Le Blond, Robt.**, London; watch, 1780.
- Le Bon, Alex.**, Paris; maker of equation clocks, 1727-30; clock, Jones collection, S.K.M., about 1770; inscribed, "Le Bon à Paris."
- Leckie, Andrew**; watch, 1780.
- Lecomte (Lecount), Daniel**, admitted C.C. 1676. "Taken from Mr. Robert Murrel, on the 5th inst., by Foot Pads, near Newington, a Pendulum Watch made by Daniel Lecount" (*Lond. Gaz.*, Aug. 4-8, 1692). The

- Hon. H. Hannen has a clock by him with long case, finely inlaid.
- Lecomte, James**, admitted C.C. 1687. "Stolen a silver watch, made by Mr. Le Count" (*Lond. Gaz.*, Feb. 15-18, 1691).
- **J. R.**, 60, Dean St., Soho, 1763-83.
- Lecount, Peter**, livery C.C. 1810; 36, Pitfield St., 1823.
- Ledart, Richard**, in Strasburg; watch, about 1620.
- Ledeur**, —, London; maker of a hexagonal table clock in the Massey-Mainwaring collection, about 1600.
- Ledieu, Jas.**, Soho, 1817.
- Ledru, Wm.**, London, 1795.
- Lee, Guthbert**, admitted C.C. 1676.
- **Samuel**, admitted C.C. 1694.
- **Ezekiel**, London; lantern clock, about 1700.
- **John**, admitted C.C. 1719.
- **George**, Lombard St., 1737-40.
- **John**, 31, Noble St., Foster Lane, 1800-4.
- **Isaac**, 10, Devonshire Buildings, Great Dover St., 1840-42.
- Leeds, W. H.**, 20, Wilderness Row, 1817.
- Leekey, Gabriel**, 15, Basinghall St., 1755-78.
- **Gabriel**, probably son of the foregoing, C.C. 1778-1815 (see also Cabrier).
- Leeming, Edwd.**, livery C.C. 1787.
- **Edward**, watch-case maker, 8, Little Britain, 1790-94.
- Leeson, William**, Coleshill, Birmingham, well known as a maker of turret clocks throughout the Midland Counties; died 1886, aged 77.
- Le Febuce, Charles** (French), admitted C.C. 1687.
- Leftin, Thomas**, admitted C.C. 1720.
- Lefosse, Wm.**, 52, Old Broad St., 1769-72.
- Leg, Jno.**, London; a good workman, taught by Earnshaw, 1780.
- Legeips, John**, London; in the B.M. a very large repeating watch with silver case decorated in *repoussé*, 1720-30.
- Legg, John**, admitted C.C. 1724.
- Le Grand, James**, admitted C.C. 1641.
- **Francis**, admitted C.C. 1647.
- Legrand, James, junior**, C.C. 1664.
- Le Gros, P. J.**, 1, Upper Crown St., Westminster; bracket clock about 1800. In 1817, Philip Gross carried on business at 12, Pantion St., Haymarket.
- Le Guay**. Fine Boulle clock with bracket inscribed "Guillaume Le Guay, à Paris, au Louvres," about 1750.
- Leguesse, L. J.** (see p. 279).
- Leicester, Jas.**, Drury Lane; pull repeating clock with visible pendulum, about 1710.
- Leigh, Thomas**, admitted C.C. 1730.
- **and Phillips**, 40, Mansell St., 1840.
- Leignes, Charles Peter**, Northumberland St., Strand, 1790-94.
- Lejeune**, —, Paris; enamelled watch, about 1780.
- Lello, James**, admitted C.C. in 1656, on producing his masterpiece with his name, its genuineness being attested by Samuel Betts.
- Lemaitre, Paul**, watch tool maker, 28, Grafton St., 1790-1810.
- Lemaître, Nicholas**, Blois, large alarum watch in pierced and engraved brass gilt case, S.K.M., 1620-30.
- Lemmon, Edwd.**, London; watch, 1790.
- **Hy.**, 19, Grenville St., Hatton Garden, 1835; 6, Upper North Place, Gray's Inn, 1842.
- Lenham, Wm.**, London; watches, 1815-25.
- Lenoir**, à Rennes, inscribed on a watch winding from the centre of the dial, about 1700.
- Le Noir, Etienne**, Paris (see p. 276).
- Lens, William**, admitted C.C. 1711.
- Leon, George Isaac**, 56, Great Prescott St., 1842.
- Lepaute, J. A.**, born 1709, died 1789. A French clockmaker, who improved the pin-wheel escapement of Amant by putting pins on both sides of the wheel. Lepaute constructed several fine turret clocks and clocks for the Louvre at Paris, wound by means of an air current and fan, a method re-invented recently. He made many curious timepieces (equation, one-wheel clocks, &c.), and was the author of an excellent "Traité d'Horlogerie" (Paris, 1760), revised and augmented, says Moinet, by the celebrated Lalande. In the second edition of this work appears Lalande's treatise on "perfect pitching." In the Jones collection at S.K.M. is a fine clock in case of Vincennes porcelain and ormolu with the date letter for 1754 and signed "Lepaute de Belle fontaine à Paris."
- Lepine**, —, "There is lately arriv'd in this city, Monsieur de l'Epine, Engineer and Machinist of the late King of France, who has brought over with him a piece of ingenuity, which is an Opera by Machines, that

has been seen by his Majesty, by their Royal Highnesses the Princesses, likewise by a great number of persons of quality of this kingdom, with their general applause and satisfaction. And being to make but a short stay here, he invites the curious to come and see the said machine, giving no other explication of the same, only that there are symphonies, musick-master, whistler, drawing of the curtain, changes of scenes, thunder and lightnings, &c., and what surprizes the more, is, that all is perform'd without any body's touching it. To be seen from Ten in the morning to Ten at night, at the Mews Chocolate House near Charing Cross, up one pair of stairs. Price Half a Crown" (*Daily Post*, Feb. 1720). This is of interest, because the Lepine referred to was probably the father of John Antoine, a watchmaker of remarkable attainments who is referred to below.

Lepine, Jean Antoine, was born in 1720, and is said to have been apprenticed to one Decrose of Grand Sacconex, Switzerland; he established a reputation in Paris, and became watchmaker to Louis XV.; about 1770 he introduced bars for carrying the upper pivots of a watch train instead of a top plate, rearranged the movement, dispensed with the fusee, used the cylinder escapement, and a mainspring barrel arbor supported at one end only. Voltaire engaged him to establish a watch factory at Ferney, about a league from Geneva, but on French soil, which met with but little success; and at its failure Lepine returned to Paris, and died in 1814.

—, —, High St., Canterbury; watch, 1805.

Leplastrier, John, 138, Upper Shadwell, 1790; 125, Minorities, 1815.

— **Louis**, 142, High St., Shadwell, 1804-15.

— **and Son**, 142, High St., Shadwell, 1820-28.

— **Isaac**, 17, King William St., Strand, 1828; 21, Holles St., Cavendish Sq., 1840-42; livery C.C. 1829.

— **Louis**, 50, Alfred St., City Rd., 1842.

— **and Son**, 20, Ludgate Hill, 1835.

Leptrope, —, London; long-case clock, about 1740.

Leroux, Alexander, C.C. 1706.

— **Jno.**, London; watch, 1710.

— **John**, 8, Charing Cross; hon.

freeman, C.C. 1781. There is a fine watch by him in the Guildhall Museum (see p. 350); 1760-1800. (See Rigby, Jas.)

Le Roy, Julien, a scientific French watchmaker, born 1686, died 1759. He devised a form of repeating mechanism much used in French watches, and substituted springs for the bell in use before (see p. 356).

— **Pierre**, son of Julien Le Roy, born 1717, died 1785. Among his conceptions was a form of duplex escapement and an escapement on which the present chronometer escapement is founded. In 1766 he exhibited a chronometer having a compensation balance composed of mercurial thermometer tubes, a plan afterwards adopted by Loseby.

Lesage, Augustus, Cockspur St., 1775; St. James's, Haymarket, 1788.

Leschot, Georges Auguste, Geneva; born 1800, died 1884; in 1840 he designed a series of machines for watchmaking on the factory system.

Lescot, Pierre, Paris; cruciform watches, about 1588.

Leslie, Jas., 6, Maiden Lane, Covent Garden, 1784-88, seconds and calendar watch, Schloss collection, about 1786; 5, Parliament St., 1790-94; 35, Oxford St.; card B.M., 1799.

— **Robert**, Merlin Place, Clerkenwell; patentee of pumping keyless work (No. 1920); 1793.

Lester, Thomas, admitted C.C. 1697.

—, —, Lombard St., 1774.

Lestourge, David, admitted C.C. 1698; watch, sun and moon hour indicator, Schloss collection, dated 1646 (see p. 143); another watch with finely pierced cock and pillars. A specimen of his work is also in the Guildhall Museum; 1690-1731.

Lestourgen, David, C.C. 1721-51.

Lestourgeon, Thomas, 49, High Holborn; known as a maker of long-case clocks, 1760-75.

L'Estrange, David, admitted C.C. 1697.

Leutier, Pierre, Paris; timekeeper mounted on the back of a finely moulded bull of Dresden china, about 1750.

Letwitch, William, 42, Lombard St., 1769-72.

Leudl, Johan; maker of a skull watch, about 1630 (see p. 96).

Leumas, J. and L., London; watch, 1828.

Levens, John, Shoemakers' Row, Blackfriars, 1790-94.

- Levin, Moses**, 7, Cook's Court, Carey St., 1790-94.
- **Lewis**, 63, Prescot St., 1804; 51, Mansell St., 1815; 123, Leadenhall St., 1830.
- Levitt**, sometime partner with Tobias, whose nephew he was.
- Levy, Joseph**, New Round Court, Strand, 1780-85.
- **Lyon**, 121, Whitechapel High St., 1780-85.
- **Hyam**, 121, Whitechapel High St., 1775-85.
- **M. and C.**, 19, Maiden Lane, Covent Garden, 1790.
- **Philip**, 30, Jewry St., Aldgate, 1798-1803.
- **Jonas**, 18, Somerset St., 1800; 135, Whitechapel, 1810; 38, Minorities, 1820.
- **J.**, Coventry St., Haymarket, 1815.
- **B.**, High St., Whitechapel, 1820.
- **J. and Son**, 49, Tooley St., 1820.
- **and Co.**, 408, Strand, 1825.
- **A.**, 17, Camomile St., 1825-35.
- **S.**, 19, Crutched Friars, 1830.
- **A.**, 183, Ratcliffe Highway, 1835.
- **Jonas**, 13, Bevis Marks, admitted free of the C.C. by redemption, being the first Jew admitted, 1831; 1820-42.
- **Abraham**, 36, Trinity Sq., Tower Hill, 1840-42.
- **and Moss**, 1, Liverpool Buildings, Bishopsgate, 1842.
- Levyson, Montague**, 125, Pall Mall, 1840.
- Lewin, William**, admitted C.C. 1731.
- Lewis, John**, admitted C.C. 1705.
- **Ambrose**, admitted C.C. 1725.
- **Joseph**, 38, Foster Lane, 1783.
- **and Alston**, 30, Bishopsgate Within, 1815-25.
- **Hy.**, London; watch, 1830.
- Ley, William**, admitted C.C. 1711.
- Leyden**. (See Stubbs and Co.)
- L'Hospital, J.**, 13, Oxendon St., Haymarket, 1842.
- Liddiard, Thomas**, 54, St. Paul's Churchyard, 1775-83.
- Lietuyt, John**, from Delft; 1368 (see p. 23).
- Light, John**, admitted C.C. 1648.
- Lightfoot, Peter**, a monk, maker of the Glastonbury and Wimborne clocks (see p. 25), 1335.
- Like, George**, 29, Butcher's Row, 1785-94.
- Lillie, Charles**, corner of Beaufort Buildings, Strand; "a seller of watches, &c.," 1710.
- Lilly**, —, Smithfield Bars, 1775.
- Limmard**, —, 54, St. Paul's Churchyard, 1796.
- Limoniere, Stephen**, admitted C.C. 1712.
- Limpard, John**; a watch by him in the B.M., about 1620 (see p. 114).
- Lind, Nich.**, 4, Norman St., Old St., 1780-25; watch, silver cock.
- Lindd, Hy.**, Farnham; lantern clock, about 1700.
- Lindesey, George**; watchmaker to George III.; a verge movement by him in the Guildhall Museum; died 1776. Mr. Geo. Mann has a fine long-case clock by him, with dead-beat escapement, about 1770.
- Lindley**, —, 10, St. Martin's Court, Old St., 1810.
- Lindsey, John**, 69, Banner St., 1825.
- Linford, Thomas**, London; maker of watches, 1626.
- Linnet, John**, 9, Cursitor St., 1815-25.
- Linney, John**; watch-case maker and liner, Featherstone St., 1790.
- Lipp, Nicholas**, Basle; maker of a remarkable clock at Lyons, 1598.
- Lipscomb, Benj.**, London; maker of long-case clocks, about 1760.
- Lips, Dan**, 136, Old St., 1817.
- Liptrop, Peter**; a well-known wheel-cutter; born in Prescot, 1793; died in London, 1879.
- Lister, Thos.**, Halifax; 1760-1802.
- Litherland, Peter**, Liverpool; patentee of the rack lever escapement (No. 1830), Oct., 1791.
- Little, Joseph**, 179 Strand, 1800.
- Littlemore, Whitestone**, apprenticed to Tompion, admitted C.C. 1698.
- Littlewort, George**, 34, Cannon St.; maker of watches for the use of the guards of the Royal Mail coaches, 1816-32.
- **Geo.**, Rahere St., 1834.
- Litmore, Edward**, 30, Tokenhouse Yard, Lothbury, and 3, Cross St., Islington, 1798-1810.
- Livingstone, J.**, London; watch, 1785.
- Lloyd, William**, admitted C.C. 1668.
- **William**, admitted C.C. 1670.
- **Joseph**, admitted C.C. 1673.
- **David**, admitted C.C. 1677.
- **Richard**, admitted C.C. 1681.
- **Charles**, admitted C.C. 1691.
- **James**, admitted C.C. 1700.
- **James**, Sheep Pens, Smithfield, admitted C.C. 1722.
- , —, 128, Minorities, 1785; card B.M.
- **and Northleigh**, London; watch, 1785.
- , —, at the "Dial," 21, Aldersgate St.; card B.M., 1790.

Lloyd, John, 21, Aldgate Within, 1790-94.

— **Wm.**, 6, Britannia Row, Hoxton, 1842.

Lochard, Robert, London; watch, about 1650.

— **John**, admitted C.C. 1655; maker of a thick round silver watch, gut to fusee, engraved dial, serrated trident hand, inscribed, "John Lochard, fecit," 1655-70.

Lockwood, Benj., Swaffham, Norfolk; long-case clock, about 1740.

Loddington, Isaac, "The Dial," Tavistock St., Covent Garden. Anna Maria Shaw was apprenticed to him and to Elizabeth his wife, 1733; 1719-34.

Lode —, London; pocket chronometer, about 1802.

Lodowick, Peter, admitted C.C. 1689.

Loggen, Johannes, Amsterdam; fine calendar watch, Schloss collection, sun and moon hour indicators, as illustrated on page 143, about 1680.

Long, Thomas, admitted C.C. 1653.

— **John**, admitted C.C. 1677.

— **John**, admitted C.C. 1698.

— **Henry**, 200, High Holborn, 1770-80.

— **and Drew**; enamellers, 5, Red Lion St., Clerkenwell, 1794-1810.

Longford, Ellis, admitted C.C. 1672.

— **Jno.**, Nottingham; clock-watch, about 1692.

— **Thomas**, hon. freeman C.C. 1781; 1760-81.

Longland, John, admitted C.C. 1677.

Loomes, Thomas, at y^e Mermaid in Lothbury, admitted C.C. 1649; a celebrated maker. Example, a small lantern clock, frets (Fig. 303), inscription, "Thomas Loomes, at y^e Mermaid in Lothbury, fecit, 1674;" 1630-74.

Lord, Richard, admitted C.C. 1632.

Lorimer, David, 17, Shoreditch, 1805-18.

— **and Edwards**, 17, Shoreditch, 1810-25.

— **William**, 24, Crown St., Finsbury, 1830; 93, Wood St., Cheapside, 1835-40.

Lormier, Isaac, London; long-case clock, about 1740.

Loseby, Edward Thomas, apprenticed to Rotherhams, of Coventry, afterwards at Gerrard St., Islington; inventor of a compensation balance, which acted by the expansion and contraction of mercury in a curved glass tube fixed at each end of the laminated rim, which was shorter

than usual (Patent 1011, Dec., 1852); 1846-90.

Lossier —, London; watch, 1770.

Louarth, Jasper, admitted C.C. 1641.

Loudan, Wm., 149, Great Surrey St., 1822; 228, Blackfriars Rd., 1840.

Loughton, William, admitted C.C. 1683.

Loundes, Isaac, Pall Mall Court, admitted C.C. 1682.

— **Charles**, Pall Mall; maker of a long-case clock belonging to the Bishop of Chester, 1700-26.

Lounde (Lowndes), Jonathan, in Pall Mall, admitted C.C. 1680; steward, 1696; a celebrated maker. Examples, a square black basket-top bracket clock, and a walnut inlaid long-case one, 1680-1700.

"Lost on the 19 past, from a gentlewoman's side, a gold pendulum watch with 2 gold cases, the outer case engraved; made by J. Lowndes, in Pall Mall, London. Whoever brings it to Mr. Lowndes, at the Dial, in Pall Mall, shall have 3 guineas reward; or, if bought, their money again with content" (*Lond. Gaz.*, Oct. 1-5, 1691).

"Lost on the 10 instant, in a Hackney Coach, between Covent Garden and Jernyn St., a Gold Pendulum Watch, the maker's name Lowndes, the Chrystal crack'd; with 2 Steel Seals tyed to it, the Coat of Arms, 10 Crosses and a Baron's Coronet, and a small Famble (*sic*), made up of 2 little Diamonds and 4 or 5 Rubies. Whoever brings them to Sir Francis Child, Goldsmith, within Temple Bar, shall have 2 guineas reward" (*Lond. Gaz.*, Nov. 16-19, 1691).

Love, Jas., 23, Aldgate, 1780-90.

— **Christopher**, 6, Old Bond St., 1816-25.

Loveace, Jacob, Exeter; maker of a famous clock (see p. 262).

Loveland —, London; watch, 1770.

Loveles, W., 14, Charles St., Hoxton, 1796.

Lovell, Paul, subscribed to incorporation of C.C. in 1630. In 1654 Mr. Paul Lovell the elder did deliver to the renter warden one silver bowl in full of all demands due to the Company.

Lovett, William, admitted C.C. 1702.

Lowe, Edwd., London; watch, 1793.

— **Jno.**, 19, Lower Smith St., Northampton Sq., 1802-18.

— **Thos.**, Dartford; watch, hare and snail indicator, 1818.

Lowrie, J. C., London; watch, about 1800.

Lowry, Morgan, Holborn, 1700.

Lowther, Thomas, clock-case maker, 58, Red Lion St., Clerkenwell, 1822-30.

Lozans, Thos., London; maker of bracket clocks, 1700-15.

Lucas, William, admitted C.C. 1669.

— **Edward**, admitted C.C. 1727.

— **Henry**, admitted C.C. 1731.

— **John**, Pear Tree St., 1800-10.

Lucie, John, admitted C.C. 1663.

Ludlam, William, one of the judges of Harrison's chronometer, 1765.

Ludlow, Samuel, C.C. 1706.

Luke, William, shagreen and morocco case-maker, 147, Aldersgate St., 1810.

Lullin, Paul, watch without hands (see p. 145), French or Swiss, about 1690.

Lum, Joseph, Spitalfields, 1700.

Lumb, John, 16, Southampton Buildings, 1790-94.

Lumbley, G., junr.; watch, 1760.

Lumpkin, Thomas, admitted C.C. 1694; maker of a walnut marqueterie long-case clock, centre engraved; over day of month circle G. R. and three crowns; 1694-1715.

Lund, John Richard, Hatton Garden, and afterwards 41, Cornhill; apprenticed to John Pennington, senr., for some time partner in the well-known firm of Barraud and Lund; died 1868, aged 63.

Lupton and Gillam, 23, St. Martin's Lane, 1825.

Lushbrook, —, admitted C.C. 1701.

Luttman, William, C.C. 1720.

Lutwiche, —, Fenchurch St., 1775.

Lutwyche, Thos. Wm., Forgate St., Worcester, card B.M., 1794.

Lyman, —, London; watch, 1810.

Lynaker, Samuel, one of the first assistants of the C.C. 1630-49.

Lynam and Bull, "at the Golden Salmon, 36, New Bond St.," card Ponsonby collection, about 1785.

Lynam and Warwick, 76, Strand, 1793.

Lynch, Robert, admitted C.C. 1670.

Lyndon, G., 30, Gerrard St., Soho, 1825-30.

Lyne, William, admitted C.C. 1703.

Lyon, Thos. Geo., St. Martin's-le-Grand, 1793.

— **Lewis**, 64, Gray's Inn Lane, 1840.

Lyons, Richard, master C.C. 1683; calendar watch by him, Shandon collection, 1670-84.

Lysney, Sebastian, clockmaker to Edward VI., 1548.

Maberley John, master C.C. 1738; 1718-39. The springs of Harrison's chronometer were made by Maberley in 1755.

McCabe, Wm., Newry; watch, 1798.

— This house was much esteemed for fine watches and clocks, especially in India. James McCabe was from a watch and clock-making family in Belfast. He came to London at the latter part of the eighteenth century, and was at 11, Bell's Buildings, Fleet St., in 1778; 34, King St., Cheapside, in 1783; 8, King St., Cheapside, in 1788; 97, Cornhill, in 1804. He was hon. freeman C.C. 1781; livery, 1786; warden, 1811, when he died, and was succeeded by his son James, who was apprenticed to Reid and Auld. The business was carried on as McCabe and Son, 99, Cornhill, till 1820; McCabe and Strahan, 1825-26. J. McCabe, 97, Cornhill, till 1838. Then J. McCabe, 32, Cornhill. Robert Jeremy McCabe, nephew of James, who succeeded his uncle at 32, Cornhill, retired in 1880, when he closed the shop, declining all offers to purchase the business. McCabe's best watches were engraved "James McCabe," the second grade "McCabe," and the lowest quality "Beatson."

Macaire, F., London, 1732; handsome alarm watch by him, belonging to M. G. Mirabaud.

— **Antoine**; watch, silver *repoussé* case, 1770.

McCarthy, Jas., 47, Holborn, 1793.

MacDowall, Joseph Eden, 257, High St., Southwark, patented an escapement in 1838.

McDowall, Charles, Church St., Kensington, 1836; 8, Victoria Rd., Pimlico, 1839; 2, Mall, Kensington, 1840; Jermyn St., 1858. A clever horologist; born in Wakefield; he patented the single-pin escapement, 1851. Example of his work, a beautifully made thirty-day skeleton clock, with Hooke's helix or twisted teeth; died 1872, aged 82.

McDuff, Jas., 47, Bury St., 1835.

Mace, Lawrence, London; to him was apprenticed Wm. Plumley, 1749.

Macgregor, J., 14, Charterhouse St., 1830.

Macham, Samuel, London; repeating bracket clock, about 1750.

Mackarsie, G., 14, Gt. Queen St., 1820.

MackCarthy, James, 47, Holborn, 1790.

- Mackdonald, Peter**, New Compton St., 1790-94.
- MacKenny, G.**, 8, Lower Ashby St., 1840-42.
- Mackie, James**, Banner St., Bunhill Row, 1810-35.
- **Geo. and Son**, 54, City Rd., 1822-25.
- **James and George**, 31, City Rd., 1835-42.
- **James**, 4, White Rose Court, Coleman St., 1830-42.
- McLachlan, Hugh**, 17, Upper East Smithfield, 1810-42; E. J. Thompson was apprenticed to him in 1829.
- MacLennan, John**, a watch and chronometer maker of the front rank, who worked for McCabes; born at Dingwall, died in London, 1886, aged 72.
- MacLennan, Kenneth**, May's Buildings, St. Martin's Lane, 1778-1825.
- **R. and W.**, 9, Great May's Buildings, St. Martin's Lane, 1815-25.
- McMaster, Wm. Jno.**, 26, Bartlett's Buildings, 1814-19.
- McNab**, —, Perth, about 1816 (see p. 294).
- McPhail, C.**, 14, Regent's St., Pall Mall, 1830.
- Macpherson, Normand**, London; long-case musical clock, about 1790.
- Macure, Thomas**, musical clock maker, 7, Great New St., Gough Sq., 1788.
- Macy, Benjamin**, C.C. 1712.
- Maddock, L.**, London; watch, 1787.
- Maddox, Edwd.**, London; centre-seconds watch, h.m. 1769.
- Madell, Charles**, 1, Waterloo Place, Clerkenwell Close, 1835.
- Maggs, William**, claimed to be successor to D. Quare, 1724-30.
- Maginie, Samuel**, Duke's Row, Pimlico, and 9, Prince's St., Westminster, 1835.
- Magniac, Francis**, "Colonel," St. John's Sq., Clerkenwell, a manufacturer of complicated clocks and automata, 1770-94.
- Magnin, J. S.**, London; watch, 1760.
- Magnus, N.**, 7, James Court, St. Martin's Lane, 1823.
- Magson, John**, Essex St.; in the Hawkins collection was a repeating watch by him, in pierced and finely engraved gold case, second case chased with classical figures and scrolls, in outer case of shagreen, about 1700.
- Maillett, Hy.**, 16, Bartlett's Buildings, 1790-94.
- Maisonneuve, Benjamin**, Craven St., Strand, 1769-72.
- Makepiece, Robt.**, 6, Serle St., Lincoln's Inn, 1775-88; afterwards Makepiece and Walford.
- Malden, Samuel**, Rainham, Essex, maker of lantern clocks, about 1725.
- Malleson, Thos.**, 62, Cornhill, 1769-83.
- Mallingley, Robt.**, 135, Goswell Rd., 1790-93.
- Malpas, J.**, 91, Wood St., 1753-75.
- Manaviere**, —, Smithfield, 1774.
- Manby, Edwd.**, London; watch, 1828.
- Manchester, John**, C.C. 1700.
- Maniglier, John**, 4, Frith St., Soho, 1840-42.
- Manley, H.**, maker of *repoussé* watch cases, 1660-90.
- **Daniel**, watch by him, *London Gaz.*, Sept. 21-25, 1693.
- Mann, Jno.**, Kentish Town; long-case clock, about 1770.
- **Josh.**, London; watch, 1782.
- **Percivall**, Lincoln's Inn Fields, 1780; Charlotte St., Oxford St., 1790-94.
- **and Muddell**, 114, Leadenhall St., 1830.
- Manning and Edmonds**, Strand; watch, 1780.
- Mansell, William**, watch-case maker, 1800, Rosoman St., Clerkenwell; fined £15 by C.C. in 1813 for refusing to take up the livery; 26, Spencer St., 1826.
- Mansfield, Jno.**, London; clock, about 1750.
- Mansir, R.**, watch-case maker, Northampton Sq., 1835.
- Mantir, G.**, 71, Snow Hill, 1830.
- Mants**, —, London; watch, 1760.
- Manwaring, Thomas**, C.C. 1694.
- Marchand**, —, Geneva, about 1725.
- Marchant, Samuel**, admitted C.C. 1700, warden, 1704; did not serve as master.
- , —, Prince's St., Leicester Fields, nephew of — Archambo, 1750.
- **Andrew**, London; watch, 1760.
- **William**, 255, High Holborn, 1775-83.
- **M.**, 350, Oxford St., 1823.
- **R.**, 20, Mortimer St., 1823.
- Marchet, Richard**, Fulwood Rents, Holborn, 1790-94.
- Marder, Henry and William**, 20, Artillery Place, Finsbury, 1842.
- Marduit, Isaac**, C.C. 1724.
- Margan and Sherban**, 6, Strand, 1793.
- Margary, Thos.**, 4, Walbrook, 1790.
- Margetts, George**, 21, King St., Cheapside, 1785; 3, Cheapside, 1804; a celebrated maker, admitted C.C. 1779; livery, 1799. In the B.M. is a superb watch movement by him. It shows ordinary time, the month,

day of the month, north and south declination, time of high water and the constellations. Another example of his work is a timepiece named on dial, "Margett's eight-days time-piece, 202," and on plate, "Geo. Margetts, London, Invt. et fecit, eight-day nautical chronometer." It is the size of a small two-day, with fusee and chain, great wheel running next top plate, spring de-
tent, escape wheel of sixteen teeth, measuring 470, and impulse roller a quarter the size of wheel. He made a regulator for the Archbishop of Armagh in 1790; 1779-1810.

Margot-Green, Pall Mall, 1700.

— **D.**, 19, Arlington St., Clerkenwell, 1835.

Marie, David, St. Martin's-in-the-Fields. In 1762 he patented (No. 771) a form of going barrel.

Marinot. (See Martinot.)

Markham, Robert, behind the Exchange, 1736-40.

— **Markwick**, behind the Royal Exchange, maker of a watch movement in the Guildhall Museum, rolling verge, balance wheel teeth cut the reverse way; another with elaborate pillars; also known as a maker of long-case clocks; two watches by him S.K.M., 1720-60.

— **John**, London; known as a maker of watches for the Dutch market, 1760-80.

Marks, L., 127, Jermyn St., St. James's, 1830-35.

— **Lewis**, 59, Prince's St., Leicester Sq., 1840-42.

Markwick, James, Royal Exchange; apprenticed to Edward Gilpin; C.C. 1666. (See Marquet.)

"Dropt the 3rd instant between the Cross Keys in Holborn, and the Temple Gate, a Gold Pendulum Minute watch, made by Jacobus Markwick, London. Whoever brings it to Mr. Wilkinson at the Black Boy against St. Dunstan's Church, in Fleet Street, shall have 3*l.* reward" (*Lond. Gaz.*, July 6-9, 1691).

— **James**, admitted C.C. 1692; master, 1720; several specimens of his work in the B.M. One, in very large silver cases, is inscribed, "Made for F.B., M.D.," another, a clock-watch of a slightly later period.

Marquet, Jacob, Augsburg, 1567 (see p. 73).

—, —, (Markwick?). "That divers Watches and Pocket Clocks which

were Mr. Samuel Betts, deceased, are to be sold at his late shop, now the shop of Mr. Marquet, watch-maker, on the backside of the Royal Exchange" (*Lond. Gaz.*, Feb. 28, March 2, 1675).

Marriott, John, admitted C.C. 1715.

— **W.**, 10, Fetter Lane, about 1760.

— **John**; musical clock maker, 10, Fleet Lane, 1780; 175, Fleet St., 1790; master C.C. 1799.

— **J.**, 148, Aldersgate St., 1806-10.

— **Wm. and J.**, 27, Fenchurch St., 1823-30.

Marsden, John, admitted C.C. 1698; master, 1731.

— **Samuel**, 4, Leathersellers' Buildings, 1820.

— **Samuel**, 23, Great Winchester St., 1835-42.

Marsh, Anthony, at ye dial opposite Bank of England, C.C. 1724.

— **Jacob**, 78, Lombard St., 1754-68.

— **Sam.**, 79, Broad St., Ratcliffe, 1793-1818.

— **James and Samuel**, 79, Broad St., Ratcliffe, 1790-1810.

— **Thos.**, King St., Clerkenwell. In 1811 he patented (No. 3488) an escapement.

— **Wm. B.**, London; handsome long-case clock, about 1800.

— **Jas.**; watch movement maker, 22, Tysoe St., Clerkenwell, 1835.

— **Jno.**; watch-case maker, 35, Clerkenwell Green, 1835.

— **Edward and John**, 61, Whiskin St., 1840.

— **H.**, 20, Down St., Piccadilly, 1840-42.

Marshall, Benjamin, C.C. 1680.

— **John**, Rainbow Coffee House, Cornhill, apprenticed to D. Quare; admitted C.C. 1689.

— **Samuel**, admitted C.C. 1689.

— **Samuel**, admitted C.C. 1718.

— **John**, Newark; maker of long-case calendar clocks, cast dial plates, about 1730.

— **Hy.**, 3, Fore St., Limehouse, 1817.

— **E.**, 61, Cannon St., 1825-30.

— **Wm.**, 3, Corporation Lane, 1816; 6, Percival St., 1830-35.

Marster, W. J., 26, Bartlett's Buildings, Holborn, 1825.

Marston, Jno., his movement seized by C.C. 1661.

— **William**, C.C. 1669.

— **John**, 4, Oxenden St., Haymarket, 1842.

Marten, Hy. and Wm., 20, Bunhill Row, 1840.

Martin, John, White Gate Alley, admitted C.C. 1679; threatened in 1682 with prosecution by C.C. for undue taking of apprentices.

— **Abraham**, engraver, C.C. 1682.

— **Jeremiah**, apprenticed to Tompion and Dent; C.C. 1687.

— **Richard**, Northampton; maker of lantern clocks, about 1695.

— **Thomas**, Royal Exchange, admitted C.C. 1699.

— **William**, Bristol; maker of lantern clocks, about 1700.

— **William**, admitted C.C. 1709.

— **John**, 16, Brownlow St., Bedford Row, 1763-69.

— **Benjamin**, "Newton Head, Fleet St., a friend of Jas. Ferguson"; maker of a curious table clock; born at Chichester, 1704, died 1782.

— **Thos.**, a good maker; mentioned by Earnshaw, 27, Cornhill, 1778-81; St. Michael's Alley, 1788-94.

— **Edmund**, 44, Queen St., Cheapside, 1790-94.

— **J. F.**, 26, High St., Marylebone, 1810.

— **G.**, 13, Church Lane, Whitechapel, 1835.

— **H.**, Bunhill Row, 1835.

— **James**, 26, Hanway St., 1835.

— **M.**, 18, Aylesbury St., Clerkenwell, 1835.

— **William**, 75, King St., Westminster, 1810-40.

— and **Saul**, 9, Bow, 1817.

— and **Mosse**, 8, Charing Cross, 1835.

Martineau, Joseph, St. Martin's Court, 1750-70; bracket clock, engraved "Josh. Martineau, senior"; maker also of gold *repoussé* watches.

— **Joseph**, 65, Red Lion St., Clerkenwell, 1790-94.

Martinot, Barnaby, Farringdon Within, 1618.

— **Balthazar**, Paris; horloger to Louis XIII., 1637 (see p. 113).

"A four-square Gold Watch, made at Paris by Monsieur Martinot. Information to be given to Mr. East, watchmaker, at Charing Cross" (*Lond. Gaz.*, June 4-7, 1677).

— **B.**, Rouen; specimen at B.M. about 1680.

— **M.**, Avignon; a watch by him, Guildhall Museum, about 1700; presented an armillary sphere to the King of France in 1701.

— **Jerome**, Paris; clock, in case of ormolu, supported by a bronze elephant, Jones collection S.K.M., about 1750. The case is inscribed "fecit par Caffieri."

Martinot, Baltazar, Paris; Boulle work clock, Jones collection, S.K.M., about 1725.

Mascarone, Gio. Batt., said to be the maker of a padlock-shaped watch, shown on p. 101, about 1635.

Masey, Thomas, mended St. Mary's Clock, Oxon., 1550.

Mason, Richard, admitted C.C. 1632.

— **William**, admitted C.C. 1688.

— **Jno.**, Bristol; made a clock for the church of Alderly to the order of Sir Matthew Hale, 1673.

— **Samuel**, admitted C.C. 1712.

— **John**, admitted C.C. 1712; maker of a lantern clock, square dial, cherub corners, bob pendulum, 1712-20.

— **Henry**, admitted C.C. 1715.

— **John**, C.C. 1718; maker of long-case clocks, 1718-30.

— **Wm.**, Bexley; watch, 1768.

— **William**, near East Lane, Rotherhithe Wall, 1760-69; Dockhead, Southwark, 1781-83.

— and **Hudson**, Strand, 1772.

— **J. Ladson**, London; watch, 1780.

— **Robert**, 11, Strand. In 1790 he sent a letter to the Clockmakers' Co. respecting watches seized on his premises.

— **John**, 3, Helmet Row, 1816-20; 1, Jubilee St., Mile End, 1840.

Masquerier, Lewis, 12, Coventry St., 1780-85.

— **Wm.**, Gerrard St., Soho, 1790-94.

— and **Perigal**, Coventry St., 1775.

Masse, James, Broad St., 1753-60.

Massey, Edmund, C.C. 1682.

— **John**, 89, Strand, and 40, Bridge Road, Lambeth, 1810-35.

— **Benj.**, 116, Leadenhall St., 1810-26.

— **Edward**, 28, King St., Clerkenwell; a Staffordshire watchmaker, who migrated from Burslem to Coventry, from thence to Prescott, and afterwards settled in London. Inventor of a form of lever escapement called the crank roller, and forms of keyless winding for watches (see p. 353). He died in 1852, aged 82, and was buried at St. John's, Duncan Terrace, Islington.

— **C.**, 40, Bridge Rd., Lambeth, 1823-35.

— **Francis J.**, 17, Chadwell St., 1840-42.

— **Thomas**, 4, Birchin Lane, and 32, Wilmington Square, 1835-42.

— **Edmund**, 89, Strand, probably the son of John, of the same address; 1835-42. A watch by him, Evan Roberts collection, centre seconds,

beating full seconds, the balance nearly as large as the plate, makes 3600 vibrations an hour. It has a lever escapement, the pallets anchor shaped as in a clock.

Massey, Edward James, 78, Cornhill, and 3, Tysoe St., Spa Fields, 1835-42. In 1838, when he patented a chronometer escapement (No. 7678), he is described as of Liverpool.

Masson, R. Aime, London; watch, Evan Roberts collection, about 1700.

— **Denis**, Paris; clock, Jones collection, S.K.M., about 1760.

Massy, Nicholas, a French refugee, admitted C.C. 1682.

"Lost the 17 instant, between the Haymarket and Temple Bar, a new Silver Pendulum Watch made by Nich. Massy, with a tortoise-shell studded case, the studs wrought, and the case lined with red sattin; and 2 seals" (*Lond. Gaz.*, Nov. 24-28, 1692); 1690-1712.

— **Henry**, son of Nicholas; admitted C.C. 1692; Charles St., near St. James's Sq., 1707; maker of a thick round silver verge, silver dial, showing day of the month, elaborately pierced movement.

— **Nicholas**, son of the foregoing Nicholas, Cranbourne St., near Leicester Fields; admitted C.C. 1693; striking watch, Schloss collection, royal arms and motto *Semper Eadem* on the movement (see p. 343); a watch movement by him, with an index on top of the cock, is in the Guildhall Museum.

— **Jacob**, Leicester Fields; admitted C.C. 1715; maker of a black, arch bracket clock, 1715-25.

Massy and Windham, 4, Birchin Lane, 1830-35.

Master, W. J., 26, Bartlett's Buildings, 1823.

Masterman, J., White Hart Court, Gracechurch St., 1769-73; Masterman and Springhall, 1793.

Masters, William, admitted C.C. 1701.

— **Jno.**, London; watch, single case, about 1735.

— **James**, 52, Strand; card B.M. 1803; livery C.C. 1810; after much negotiation he was in 1812 transferred to the Goldsmiths Company on payment of £30 to C.C.

Masterson, Richard, at the Royal Exchange; subscribed to the incorporation of C.C. in 1630; admitted C.C. 1633; master, 1642; died 1653. In the Guildhall Museum is an oval watch by him, cockle-shell case,

plain silver dial, hour hand only, catgut; 1618-53.

Maston, D., London; watches, 1795-1820.

Matchett, John, Covent Garden, admitted C.C. 1648; signed a petition against the company's oppression, 1656; assistant, 1670, but suspended, as well known to be a popish recusant, 1678. "Lost on the 11th inst. about Lincoln's-Inn-Fields or Covent Garden, a silver watch ingraven with several Figures, made by John Machett, a studded case with silver Pins" (*Lond. Gaz.*, June 12-15, 1676).

Matham, Robt., 66, Newgate St., 1783.

Mather, Samuel, admitted C.C. 1691.

Mathew, Francis, C.C. 1656.

Mathews, William, 27, Fleet St., admitted C.C. 1731; assistant and livery, 1766; one of the examiners of Harrison's timekeeper in 1765.

— **W. and C. S.**, 128, Minories, 1817.

— **and Thorpe**, 10, Artillery Place, 1840-42.

Matthew, John, admitted C.C. 1731; maker of long oak-case clock, with day of the month circle; 1731-40.

Matthews, John, 36, Goswell Rd., 1840.

Mattison, Thos., 62, Cornhill, 1793.

Mattocks, John, summoned to livery C.C. 1786.

Maude, Benjamin, 53, St. Martin's-le-Grand, 1780-94.

— **Edward**, 14, St. Paul's Churchyard, 1793-98.

Maurer, Johann, in Fiessna. In the B.M. is a small skull-watch by him, 1650-60.

Maweis, —, chaser of watch cases, about 1780. (See Potter, Harry.)

Mawley, Robt., London; bracket clock, about 1725.

May, William, admitted C.C. 1679.

— **John** (Dutch), admitted C.C. 1692; watch, about 1700.

—, —, admitted C.C. 1754. "A large quantity of gold and silver watches, with a time piece, and some other curious things of value, were found in the gully hole at Holbourn bridge, by the workmen, in cleaning it. These things had been taken some days before from the house of Mr. May, watchm'ker, in Bridgewater square; and were returned on the payment of 10 guineas, prom'd by advzt. for the recovery of them" (*Gent's. Mag.*, Aug. 24, 1765).

— **Samuel**, 51, Myddelton St., Clerkenwell; an expert watch and

- chronometer springer; died 1871, aged 58.
- Mayes, John**, 8, Lower Charles St., Goswell Rd., 1842.
- Mayland, Thomas**, admitted C.C. 1698.
- Maynard, Christopher**, Royal Exchange, apprenticed to Hacket, admitted C.C. 1667. (See Hicks.)
- Mayo, Joseph**, Craven St., Strand, 1769-72.
- , —, Coventry, about 1780-90.
- Maysmore, Wm.**, Wrexham, about 1720.
- Mayson, John**, admitted C.C. 1704.
- Mead, Wm.**, 1, Corporation Lane, 1835.
- Meade, Garrett**, admitted C.C. 1703.
- Meades, Thomas**, admitted C.C. 1687.
- Meak, John**, musical clock and watchmaker, 7, Worship St., Shoreditch, 1825.
- Meanley, —**, maker of a pair-case verge watch, with an engraving on the back representing the Queen of Sheba before Solomon; about 1770.
- Mears, Jno.**, watch engraver, 48, Cloth Fair, 1790-94.
- Measure, A.**, 420, Strand, 1815-20.
- Medhurst, Richard**, Croydon, admitted C.C. 1687.
- Meek, Jno.**, musical clock and watchmaker, 7, Worship St., 1812-18.
- Meigh, Moses**, admitted C.C. 1712.
- Melchior**. (See Adam.)
- Mellin, Gui**, Blackfriars, maker of an oval watch in the B.M., glass over the dial, 1600-20.
- Melville, John**, hon. freeman C.C. 1781.
- and **Stoddart**, 61, Red Lion St., Clerkenwell, 1804-10.
- **Jas.**, watch-case maker, 13, Spencer St., 1816.
- **Robert**, 40, King St., Clerkenwell, 1835.
- Mendham, —**, received a silver medal from the Society of Arts in 1807 for a remontoire.
- Menessie, Elisha**, Aldersgate St., 1790-95.
- Meniall, James** (French), threatened with prosecution by C.C. for exercising the art, not being admitted, paid costs and was admitted forthwith, 1682.
- Menzies, John**, 4, Charles St., Northampton Sq., 1840-42.
- Mercer, John**, Hythe, maker of long-case clocks, about 1720.
- **Brothers**, Coventry, about 1770-90.
- Merchant, Samuel**, admitted C.C. 1677; assistant, 1698.
- Mercier, —**, London; watch, 1725.
- **Louis**, Geneva, about 1690.
- Meredith, Lancelot**, signed a petition against the tyranny of C.C. 1656.
- **John**, admitted C.C. 1664.
- **Jno.**, London; watch, gold box h.m. 1758, outer case *repoussé*.
- Merigeot, John**, livery, C.C. 1766.
- Meriton, Samuel**, 18, Foster Lane, Cheapside, 1793-1800.
- Merlin, John Joseph**; mechanical genius; born 1735 at Huys, near Liege. Arrived in England in 1760. Soon after this became principal mechanic at Cox's Museum, which he left in 1773. He proved himself a maker of engines, mathematical instruments, and a watch and clock maker. He constructed a curious dial or regulator which never required winding up, as that was done by the room door opening.
- Merny, Charles**, Spitalfields, liveryman C.C. 1776.
- Merrell, Jno.**, London; watch, enamelled case, 1790.
- Merrick, Joseph**, 28, Paul St., Finsbury, 1835-42.
- Merrill, Charles**, livery C.C. 1810.
- **H.**, Hill St., Richmond, 1840.
- Merriman, Benjamin**, admitted C.C. 1682.
- Merrin, Henry**, 100, High St., Shadwell, 1840-42.
- Merry, Charles**, livery C.C. 1766; master, 1768; 1755-69.
- Merryman, Henry**, C.C. 1674.
- Merttins, George**, Cornhill; goldsmith and watchmaker, succeeded to the business of his father; admitted C.C. 1688; master, 1713; knighted, 1713; Lord Mayor, 1724; died 1727.
- Mesniel, James** (French), admitted C.C. 1682.
- Mestager, Henry**, C.C. 1712.
- Mesure, Anthony**, 8, Craven Buildings, Drury Lane, 1810; 420, Strand, 1814-23.
- Metcalf, George Marmaduke**, Round Court, St. Martin's-le-Grand, admitted C.C. 1781; summoned to livery, 1786; 122, Newgate St., 1794-1825.
- **Josh.**, 146, Oxford St., 1816-30.
- Metcalfe, Mark**, Asknigg; died 1776, aged 89.
- Methem, Robt.**, 66, Newgate St., 1775.
- Micabius, John**. C.C. ordered him to be sued for failing to pay a promised contribution towards incorporation, 1632.
- Michand, P.**, Paris; about 1755.
- Michant, Daniel**, 28, Greek St., 1794.
- Michell, Jo.**, Chardstock; lantern clocks, about 1700 (see p. 307).

- Michells**, 63, St. Mary Axe, 1830.
Micklewright, Erasmus, C.C. 1673.
 —, —, admitted C.C. 1708.
Middleditch, John, 156, High St., Shadwell, 1835-42.
Middleton, William T., 10, Grenada x Terrace, Commercial Rd., 1835-42.
Midnall, John, in Fleet St., one of the first assistants C.C.; maker of a small oval watch said to have belonged to Oliver Cromwell, B.M.; also a silver watch with flowers engraved on the outer case; 1620-33 (see p. 116).
Milborne, John, admitted C.C. 1698.
Miles and Morgan, 32, Ludgate St., 1790-94.
 — **Septimus**, 32, Ludgate St., 1794; livery C.C. 1810; 8, Little Carter Lane, Doctors' Commons, 1825-42.
 — **G.**, Guildford St., Boro', 1830.
Milfield, D., London; watch, 1790.
Mill, David, admitted C.C. 1655.
Millenet, Daniel; clock-watch with alarum; about 1630.
Miller, John, admitted C.C. 1674; lantern clock, dolphin frets, inscribed, "John Miller, Showe Lane"; belonging to Mr. Edward Sudell; Fromanteel in 1665 speaks of one Miller as taking many apprentices.
 — **Peter**, admitted C.C. 1681.
 — **Ralph**, admitted C.C. 1697.
 — **Joseph**, admitted C.C. 1728.
 —, —, Lurgan, Ireland; maker of a curious clock in which the hour was uttered by a human figure, as appears from the journal of the Rev. John Wesley, in a clear articulate voice, 1762.
 — **Thos.**, London; maker of a pair-case watch, outer case tortoiseshell, painted dial, h.m., 1764; another, Dutch style, 1780.
 — **Fred**, 38, Greek St.; card B.M., 1797.
 — **Chas.**, Aldgate Within, 1816-25.
 — **Robt.**, Tottenham, 1820; 2, George St., Commercial Rd., 1835; 4, Upton Place, 1842.
 — **F. and Co.**, 10, Broad St., Bloomsbury, 1835-40.
 — **Jas.**, 262, High St., Poplar, 1842.
Milleret, —. Extra small watch, gold case, enamelled with a rose.
Millet, William, admitted C.C. 1714.
Millett, Edward, admitted C.C. 1680.
Millington, Thomas, 31, Gutter Lane, Cheapside, 1760-69.
 — and **Lancashire**, London; watch, 1768.
 — **Thomas**, 33, Wapping, 1790.
Million, William, Blackfriars, admitted C.C. 1671.
Millot. "Horologer du Roy, Paris"; inscribed on the base of a fine urn timekeeper, about 1680; the movement was by Derryhouse, London.
Mills, Thomas, in Shoe Lane, admitted C.C. 1652; maker of lantern clock with Dolphin frets; another example inscribed, "Tho. Mills, Soe Lane, Londini," 1648-60.
 — **Ralph**, admitted C.C. 1697.
 — **Richard**, Edinburgh; apprenticed to Humphrey Mylne; made a free-man of the Incorporation, 1678; his essay being, "Ane clock watch and luminary, with the further addition of a lock and key"; declined the office of "box-master" or treasurer in 1703; died 1705.
 "Stolen out of a house near the West Port on the 19th, a gold watch with a steel chain and a shagreen case. Whoever can bring the said watch to Richard Mills, watchmaker in Edinburgh, shall have two guineas reward" (*Edinburgh Gazette*, 1695).
 — **Thomas**, London; watch, h.m. 1762.
 — **Robert**, 141, Ratcliff Highway, 1790-94. Wm. Mills, same address, 1809-18.
 — **Thomas, and Son**, 26, Red Lion St., Clerkenwell, 1812-18; 91, Bishopsgate Without, 1823.
 — **George**, 141, Goswell St., 1825.
Milner, Thomas, London, maker of long-case clocks, about 1780.
 — **Henry**, 7, Vere St., Oxford St., 1815.
Milton, —, 29, Mary-le-bone St., Golden Sq.; card, B.M., 1802.
Milward, Geo., 2, Little Brook St., 1806-15.
Mimess, R., Woolwich, 1816.
Minchener, Saml., London; long-case clock, about 1810.
Minchinalle, William, C.C. 1701.
Miroir, —, London; a large pull-repeating clock watch in silver case, outer case of leather with silver mountings, formerly in the Shandon collection. This name is probably fictitious; after examination I came to the conclusion that the watch was of Dutch make, about 1740.
Misplace, R., Searle St., Lincoln's Inn Fields, 1775-88.
Mitchell, Myles, admitted C.C. 1640.
 — **John**, St. James's St., apprenticed to Jno. Earles, admitted C.C. 1712.
 — **Robert**, livery C.C. 1766.

- Mitchell, Samuel**, St. James's St.; repeating watch, h.m. 1776.
- **and Viet**, 6, Cornhill, 1768.
- **Jno.**, 6, Cornhill, 1817.
- **Chas.**, 84, Tower Hill; watch, 1822.
- **and French**, 5, Clerkenwell Close, 1825.
- Mitchelson, Jas.**, Throgmorton St., 1753-56.
- **Alexander**, 45, Michael's Alley, Cornhill, 1769-72.
- **Walter**, 3, Helmet Row, 1780-1800.
- Mitford, John**, apprenticed to Sir George Mertins, of Cornhill, whose daughter he married in 1714, when he was 19 years old. £200 stock of the Exchange Assurance Association standing in his name, which, with interest, had accumulated to £6600 in 1883, was then ordered by Mr. Justice Williams to be paid to his nearest relatives.
- **Robert**, Cornhill, liveryman C.C. 1776.
- Mitten, Francis**, Chichester; 30-hour long-case clock, about 1750.
- Mitzell**, —, London; pendulum watch, Schloss collection, about 1700 (see p. 148).
- Moginie, Samuel**, 1, Prince Row, Pimlico, 1822-42.
- Moinau, Auguste**, Philpott Terrace, Edgware Rd.; patented in 1840 (No. 8501) a system of detached weights for clocks.
- Moinet, Louis**, author of "Nouveau Traité Général Astronomique et Civil d'Horlogerie Théorique et Pratique;" Paris, 1848.
- Molee, P.**, 44, Great Sutton St., 1835.
- Molens, Charles**, admitted C.C. 1709.
- Molleson, Thos.**, 62, Cornhill, 1788-1810.
- Molyneux, Robert**, a chronometer maker who carried on business at 44, Devonshire St., Queen's Sq., and afterwards in King St., Holborn; inventor of a compensation balance with auxiliary (Patent No. 8418), March, 1840.
- **R., and Sons**, 30, Southampton Row, Russell Sq., 1835-42; they were succeeded by Birchall and Appleton. Robert Molyneux, Junior, went to America and settled there.
- Moncas, John**, 75, Myddelton St., Spa-fields, 1835.
- Monday, Joseph**, admitted C.C. 1654.
- Monk, Edwd.**, 171, Fleet St., 1793.
- Monkhouse, Thomas**, Duke St., fecit, anno 1759; inscription on the barrel of a fine 8-day long-case clock with high-numbered train, end pieces, and all the repeating work pivoted with cocks. On the dial the name Curteen, 1759.
- Monnier, John**, 38, Southampton St., Strand, 1812-28. (See Wilson, W.)
- Monro, Benjamin**, 13, Moor St., Soho Sq., 1830-42.
- Montagu, T.**, London, about 1760; a watch by him, pinchbeck inner and shagreen outer case, exhibited at the Guelph Exhibition by Mr. Geo. Carr Glyn.
- Moodie, David**, admitted C.C. 1649; gave a silver dish in 1651.
- Moody, Charles**, 45, Rupert St., Piccadilly, 1815-25.
- Moon and Co.**, 4, Holborn Bars, 1790.
- **Christopher**, 4, Lower Holborn, 1810; watch, Schloss collection.
- **William**, 4, Lower Holborn, 1815-42; livery C.C. 1820.
- Moor, William**, admitted C.C. 1701.
- Mooran, Andrew**, London, maker of clocks, about 1760. (See Moran.)
- Moore, Joseph**, admitted C.C. 1690.
- **Daniel**, admitted C.C. 1697.
- **Thos.**, Ipswich. "Whereas Thos. Moore, clock and watchmaker in Ipswich, have for many years observ'd the misfortunes which very frequently happen to pocket-watches of all sorts—viz., by sometimes coming into unskilful hands, &c., and often into the hands of servants (in absence of the owners thereof) they, endeavouring to wind up the watch, have turned the wrong way, and by so doing, they have broke the work (and the like often happens when Juice of Grape Predominate). Therefore this to give notice, That the above Thos. Moore have now made up several curious Silver and Gold Watches (and will continue to do so) so curiously contriv'd, that let the watch be wound up which way they please, either to right or left, they cannot fail of winding up the watch, with more safety than if wound but one and the common way, and are to be sold at very reasonable price. Any person or persons may have the freedom to



seeing any of the said watches at his house in Ipswich aforesaid" (Ipswich Newspaper, 1729). At the Horo-

- logical Institute is a fusee of one of Moore's watches, which was sent from Syracuse, New York, by Mr. Geo. R. Wilkins. The great wheel and larger end fusee are shown in the accompanying cut, and the action will be understood by those conversant with watch work. The device was described by Thout in 1741, some years after Moore's advertisement appeared.
- Moore, F.**, 37, Gracechurch St., 1770-75.
- **John**, 118, Fleet St., 1769-75.
- **Wm.**, 55, Paternoster Row, 1775-88; 5, Ludgate St., 1793.
- **Peter**, 15, Sweeting's Alley, 1780-1806; verge watch by him, square pillars, in the Guildhall Museum.
- **and Gearing**, 55, Paternoster Row, 1783.
- **and Edwards**, 4, Holborn, 1793.
- **and Starkey**, 89, St. Martin's Lane, 1823.
- **Patrick**, 15, Sweeting's Alley, 1806-10.
- **E. T.**, 37, Clement's Lane, 1823; 8, Prospect Place, Kingsland, 1835.
- **George**, third son of Jno. Moore (Handley and Moore), 23, Percival St., 1838; afterwards succeeded F. B. Adams and Sons at 21, St. John's Sq.; died 1894, aged 80.
- **Jno.**, formerly partner with Handley, Clerkenwell Close, then Jno. Moore and Sons; 1824-42.
- Moraley, Wm.**, London, 1828.
- Moran, Andrew**, Earl St., St. Giles. This name appears on the disc at the top of an arch-dial eight-day case-clock at the Crown, Harlesden, where it is stated to have been since 1740.
- More, B.**, London; watch, 1760.
- **Charles**, 19, Holywell Row, Shore-ditch, 1840-42.
- Morehouse, W.**, London; watch, 1807.
- Morgan, Richard**, petitioner to Charles I. for incorporation of C.C., and one of the first assistants, 1629-49.
- **Robert**, admitted C.C. 1639.
- **Jude**, admitted C.C. 1654.
- **Thomas**, admitted C.C. 1658.
- **William**, Southwark, 1696.
- **John**, admitted C.C. 1703.
- **and Miles**, 32, Ludgate St., 1790.
- **Wm.**, London; watch 1810.
- Morice, David, and Son**, 15, Fenchurch St., 1804-23; 86, Cornhill, 1826-36; watch, h.m. 1823, "D. & W. Morice, Fenchurch St. and Cornhill."
- Moriffet, R. and C.**, 22, Denmark St., Soho, 1783.
- Morland, Wm.**, Red Cross St., 1780-85.
- Morland**, —, 17, Redcross St., 1790-94.
- Morliere**, born at Orleans; excelled as a watch-case enameller at Blois, about 1650.
- Morreton**, —, London; watch, about 1775.
- Morris, Edwd.**, assistant C.C. 1677.
- **Henry**, 82, Fleet St., 1753-75.
- **John**, admitted C.C. 1799.
- **T.**, 68, Bell Dock, Wapping, 1794.
- Morriset and Lukin**, 22, Denmark St., St. Giles', 1793.
- Morrison, Richd.**, 15, Cheapside, 1769-83. "Richard Morrison at his old shop [No. 15] the Three Kings and Golden Ball opposite Foster Lane, in Cheapside, successor to Mr. Stafford Briscoe," card Ponsonby collection.
- **William N.**, 33, Ludgate Hill, 1840.
- **John**, 27, Packington St.; a well-known clockmaker; died 1893, aged 77.
- Morritt and Lee**, 93, High Holborn, 1816.
- Morse, Richard**, 8, Charing Cross, 1835-42 (succeeded Rigby).
- Morson and Stephenson**, 98, Fleet St., 1760-72.
- **Richard**, 12, Ludgate St., 1775.
- Mortimor, Chas.**, London; watch, 1824.
- Mortimore**, —, Dartmouth; watch, 1825.
- Morton, Samuel**, 210, Borough, 1775.
- **and Milroy**, 1800.
- Mosbrucker**, à Saverne, about 1750.
- Moseley, William**, C.C. 1680.
- Mosely, Elinor**. Elizabeth Askell was bound apprentice to her in 1734; C.C. 1726-34.
- **Martin**, 28, Goulston Sq., 1804; 6, Bevis Marks, 1815-35.
- **Ephraim**, 48, Leadenhall St., 1840-42.
- **Moses**, 26, Bury St., 1830-42.
- **Robert, and Son**, 113, Fetter Lane, 1822-42.
- Moser, George Michael**; maker of fine *repoussé* watch-cases, 1716-30.
- Moses, Ephraim**, 135, Whitechapel, 1790.
- **Selegman**, London; long-case clock, about 1775.
- Moss, Thos.**, Frodsham; long-case clock, about 1740.
- **Thomas**, 24, Ludgate St., 1775; livery C.C. 1786; died 1827.
- **John**, 106, Holborn Hill, 1825.
- **B.**, Tabernacle Walk, 1835.
- Motley, Richard**, admitted C.C. 1682.
- Mott and Bellin**, 91, Bishopsgate Without, 1815.

- Mott, William**, 91, Bishopsgate Without, 1830; 55, Cheapside, 1835.
- Motteux, Samuel**, C.C. 1697.
- Mottram, John**, Warden Court, Clerkenwell Close, 1790-94.
- Mottu, Brothers**, 11, Richmond Buildings, Soho Sq., 1840-42.
- Moule, Jas.**, London; long-case clock, about 1785.
- Mouline, A., and Co.**, 29, Percy St., Tottenham Court Rd., 1842.
- Moulton, Henry**, admitted C.C. 1685.
- **Saml.**, 210, Borough, 1788-1800.
- Mount, William**, admitted C.C. 1692.
- Mountford, Zachariah**, St. Albans; admitted C.C. 1684.
- Mowltou, Conan**, admitted C.C. 1700.
- **Henry**, admitted C.C. 1715.
- Moysant, —**, Blois; maker of a watch in the Massey-Mainwaring collection, case finely painted in enamel (see p. 98).
- Moysel, —**, Blois; maker of a skull watch (see p. 95), 1587.
- Moze, Henry**, Shadd Thames; clock, about 1740; watch, 1760.
- Muckarsie, George James**, 47, High Holborn, 1794; livery C.C. 1824.
- Mudge, Thomas**, Fleet St.; a celebrated maker; born 1715, died 1794 (see p. 225).
- **and Dutton**, 148, Fleet St., 1766-90. I am uncertain when the partnership was dissolved, but T. Mudge, jun., refers to Dutton in 1790 as Mudge's late partner. (See Dutton.)
- **Jno.**, London; regulator, about 1830.
- Mulford, John**, died while warden C.C. 1748; 1730-48.
- Mulgrave, Geo.**, London; watch, 1800.
- Muller, Andreas**; clock, Solykoff collection, about 1570.
- **Johan Conrad**; curious clock, about 1705.
- **and Thum**, 40, King St., Soho, 1842.
- Muncaster, Lancaster**; Thos. 1797-1830; Wm. 1806; Jno. 1806.
- Munden, Francis**, admitted C.C. 1653.
- Murray, Wm.**, Edinburgh, 1712.
- **T.**, London; watch, Schloss collection, about 1780.
- **and Strahan**, 19, Sweeting's Alley, 1816-25.
- **James**, 30, Cornhill, 1814-42; livery C.C. 1817.
- Mussard, Daniel** (Genevese), admitted C.C. 1686; maker of a watch in the Hamilton collection, bought by Lord Moray at the auction sale in 1882, for £154 10s. Portraits of the Stuart family were enamelled thereon; 1670-90.
- Musson, —**, Paris, clockmaker, 1780.
- Muston, Geo.**, Red Lion St., Clerkenwell, 1835-42.
- Mut, Gerard**, Frankfort; watch, Vienna Treasury, with train wheels quadrangular and pentagonal, about 1670.
- Myddleton, Timothy**, C.C. 1687.
- Myers, John**, 255, High Holborn, 1790.
- **John**, 255, Borough, 1783-1804.
- **Hy.**, 164, Ratcliff Highway, 1804.
- **Moses**, 152, Regent St., 1830.
- **Abraham**, 79, Leman St., 1840-42.
- Mylne, Humphrey**, Edinburgh; made a clock for Magdalen Chapel, Cowgate, the meeting-place of the Incorporation of Hammermen in 1666, died about 1690.
- **G. E.**, foreman for Yonge; afterwards at 9, Upper Chadwell St., maker of high-class watches, sometime hon. secretary to the Horological Institute; died 1868, aged 53.
- Mynuel, —**, Paris; clock, S.K.M., 1700.
- Myrmecides, —**, Paris, about 1530; thought by Dubois to be the inventor of cruciform watches.
- Myson, Jeremiah**, C.C. 1698.
- Nadauld, Wm.**, 129, Houndsditch, 1804-20.
- **W. R.**, White Hart Court, Lombard St., 1819-33.
- Naizon, Francis**, 42, Poultry, 1780-85.
- Nash, Wm.**, oval watch, metal case, Mr. Edwd. Parr, about 1605 (p. 115).
- **Thomas**, admitted C.C. 1717.
- **Samuel**, 11, Broadway, Blackfriars, 1790-94.
- Nathan, Henry**, Ratcliff Highway; admitted C.C. 1673; maker of long-case clocks, 1673-1700.
- **Phineas**, 9, Magdalen Row, 1840-42.
- Nau, Richard**, admitted C.C. 1661.
- **George**, admitted C.C. 1675.
- Naudey, Francis**, 59, Dean St., Soho, 1842.
- Naylor, Jos.**, Nantwich, Cheshire; made a curious astronomical clock, about 1750.
- Neale, John**, Leadenhall St., 1753-59.
- Neat, J.**, 40, Duke St., Manchester Sq., 1817.
- Neate, Wm.**, 3, Sweeting's Alley, 1817.
- Needham, Benjamin**, C.C. 1709.
- **Robt.**, 56, Piccadilly, 1793.
- **Charles**, 55, Piccadilly, 1825.
- Neighbour, William**, C.C. 1685.
- Neild, James**, 4, St. James's St., 1755-94.
- **J.**, 4, Upper Thames St., 1788.

Nelmes, Robert, admitted C.C. 1717.
 — **Robert**, 38, Upper King St., Bloomsbury, 1842.
Nelson, James, apprenticed to Oswald Durant, 1638; admitted C.C. 1645; maker of an astronomical watch in Guildhall Museum.
 — **Robert**, admitted C.C. 1697.
 — **John**, 15, Hayfield Place, Mile End, 1842.
 — **Thomas**, London, chronometer maker, died 1882.
Nemes, John, admitted C.C. 1724.
Nerry, Jno., London; a watch by him, Guildhall Museum, about 1730.
Neuens, Peter, 32, Bread St., 1840-42.
Neuren, D. (also spelt Neveren and Neweren), London; maker of verge watches, 1760-90.
Neuwers, Michael, makes a clock for the Earl of Shrewsbury (see p. 47), 1599.
Neville, J., London, a maker of watches, about 1704.
Newbrough, Jeremiah, Graves Inn, maker of long-case clocks, 1700-10.
Newby, John, 3, Judd St., 1825.
Newcomb, Joseph, livery C.C. 1810.
Newell, William, livery C.C. 1810.
Newland, Ab., London; watches, 1813-25.
Newman, Joseph, 30, Great Alie St., 1790.
 — **John**, 49, Lombard St., 1775-83.
 — **John**, 17, Piccadilly, 1804-25; livery C.C. 1810.
 — **Robert**, livery C.C. 1810.
 — **Wm.**, 109, Golden Sq., 1840-42.
Newnham, Nathaniel, C.C. 1703.
Newsam, Bartholomew, Strand. He was appointed, in 1572, clockmaker to Queen Elizabeth, in succession to Nicholas Urseau (see p. 152), 1570-93.
 — **Jno.**, clockmaker, York, 1586.
Newsham, Wm., Clerkenwell Close, 1765-93.
 — **Richard**, Liverpool; calendar watch, 1791.
Newsom, Thos., London; watch, 1828.
Newton, George, London, about 1680.
 — **William**, East Smithfield, C.C. 1685.
 — **Thomas**, Fenchurch St., 1753-56.
 — **John**, 76, Lamb's Conduit St., 1788-1810.
 — **Jno.**, 10, Great Ormond St., 1788-1815.
 — **Alexander, Levi, and Co.**, 4, Bury St., St. Mary Axe, 1839-42.
Nicasius, —, London; small octangular watch, Schloss collection, about 1610.
 — **John**, admitted C.C. 1632; several

times fined for abuse and disrespect, and in 1679 was suspended from being assistant; master, 1653-55.
Nichol, Isaac, admitted C.C. 1681.
Nicholas, W., 158, Tooley St., 1825.
 — **Samuel, and Son**, 158, Tooley St., 1835-40.
Nicholls, Roger, admitted C.C. 1667.
 — **Thomas**, admitted C.C. 1707.
 — **John**, clock-case maker, 6, Red Lion St., Clerkenwell, 1804-10.
Nichols, Thomas, apprenticed to Edward East; admitted C.C. 1720.
Nicholson, John, 53, Cornhill, 1816-30.
Nickisson, S., Lower Ashby St., 1815-40; 33, Northampton Sq., 1842.
Nicole, John, keeper of the great clock within the palace of Westminster in 1731, his wages being sixpence a day; 1371.
 — **Adolphe**, Dean St., Soho; patented keyless work, 1844 (see p. 354).
Nicoll, Wm., 117, Great Portland St., 1790-1835.
 — **John**, 117, Great Portland St., 1814-42.
Nightingale, Wm., Red Lion St.; liveryman C.C. 1776-94.
Niloe, Hans (Dutch); maker of a musical clock for James I. In August, 1609, Sir Julius Cæsar writes to the Clerks of the Signet to the effect that Niloe is pressing for the £300 due to him for the clock.
Nixon, Thos.; oval watch, Guildhall Museum, about 1605.
Noades, J., Strand, 1775.
Noakes and Nylder, 129, Houndsditch, 1790-94.
 — **Jas.**; watch movement maker, 34, Charterhouse St., 1776-94; livery C.C. 1776.
 — **Jas.**, 126, Houndsditch, 1800; 24, Bishopsgate St. Within, 1810-18.
Noble, Jas., Lancaster, 1733.
 — **Wm.**, London Bridge; maker of long-case clocks, about 1760.
 — **Wm.**, 2, Cow Cross St., 1804.
 — **and Harrison**, 35, Fetter Lane, 1816-25.
 — **C.**, 211, Strand, 1830.
Nobson, John, apprenticed to Daniel Quare; admitted C.C. 1697.
Nodes, John, Strand, 1770-75.
 — **William**, 126, New Bond St. In 1790 he wrote to C.C. respecting watches seized on his premises; 1783-94.
Noel, Aymé; maker of a watch, B.M., crystal case, dial and outer case of silver, about 1620.
 — **Saml.**, London; watch, Schloss collection, about 1800.

- Noir**, Paris; watch, about 1770.
Nollorth, Chas., Yarmouth, 1775.
Noon, —; seller of lamp clocks at the White Hart, in the Poultry, 1731.
Norcott, John, admitted C.C. 1681. Lost on my Lord Mayor's Day, a middle-size Gold Pendulum and Minute Watch, with an engraven Out-Case, having a scarlet French Ribon flower'd with Gold and black, the Inner-Case scraped on the back-side with a Touch-stone; the name John Norcott. Whoever brings it to Shuttleworth's Coffee House at Charing Cross, shall have 5 Guineas Reward.—1691.
Norgate, John, admitted C.C. 1712.
Norman, Chas., London; watch, 1820.
 — **Samuel**, 50 and 51, Prince's St., Leicester Sq., 1825.
Norris, Joseph, admitted C.C. 1670.
 — **Edward**, at the Cross Keys in Bethlem; admitted C.C. 1658; master, 1686; maker of full-size lantern clock, balance escapements, dolphin frets, inscribed, "Edward Norris, at the Cross Keys in Bethlem, Londini."
 — **Dav.**, London; long-case clock, about 1750.
 — **Charles**, admitted C.C. 1687.
 — **Junr.**, 22, Cheapside, 1795.
 — **Chas.**, 18, Gracechurch St., 1763–94.
Norry, N., Gisors; small clock-watch, about 1620.
North, William, admitted C.C. 1639; maker of an oval watch, silver case, B.M. (see p. 156), 1620–64.
 — **John**, admitted C.C. 1650.
 — **John**, admitted C.C. 1720.
 — **Wm.**, White Hart Yard, Drury Lane, 1790.
 — **Richd.**, 44, Lombard St., 1772–1800.
 — **Fredk.**, 2, Old Compton St., 1816; Thos. North, same address, 1820.
Northam, J., 46, Greek St., 1817.
 — **G.**; musical clock maker, Tabernacle Sq., Finsbury, 1825.
 — **and Son**, 49, Greek St., Soho, 1825.
Northcote, Samuel, son of a Plymouth watchmaker, and elder brother of James Northcote the artist, was sent to London to Mudge to be instructed in watchmaking in 1766; a watch by him inscribed, "Samuel Northcote, Plymouth"; about 1780.
Northey, John, 181, Brick Lane, Spitalfields, 1790–94.
Norton, Thomas, admitted C.C. 1720.
Norton, Samuel, Fish St. Hill; liveryman C.C. 1776; 1770–80.
 —, —, Market Row, Yarmouth, 1788.
 — **Eardley**, 49, St. John St., Clerkenwell, a well-known maker of musical and astronomical clocks and watches. In 1771 he patented (No. 987) "a clock which strikes the hours and parts upon a principle entirely new; and a watch which repeats the hours and parts, so concisely contrived and disposed as to admit of being conveniently contained not only in a watch, but also in its appendage, such as a key, seal, or trinket." There is in Buckingham Palace an astronomical clock with four dials he made for George III. Another example of his work is a splendid four-train, repeating, and musical clock in the possession of Mr. J. E. Whiting, Andover, Mass., U.S.A., and formerly the property of Mr. Edward Savage, Mr. Whiting's grandfather. It is 28 in. high, chimes the quarters on 8 bells, and plays on 16 bells one of 11 tunes every three hours; 1770–94. He was succeeded by Gravell and Tolkein.
Norton, Graham, maker of a clock, about 1790.
 — **W. D.**, London; watch, about 1820.
 — **B.**, watch-case maker, 59, Banner St., 1835.
Notyap. (See Payton.)
Nourissou, Guillaume; reconstructed the Lyons clock in 1660 (see p. 52).
Nourse, Thomas, 22, Beach Lane; livery C.C. 1766; 1756–94.
Nouwen, Michael, London. In the B.M. is a watch with an irregular octagonal-shaped crystal case, the plates are enamelled, a choice specimen of the period; 1600–1620.
Nurse, John, admitted C.C. 1718.
Oakes, Richard, shagreen case maker, 86, Snow Hill, 1775.
 — **John**, Grub St., 1775–80.
Oakley, Wm., 39, High St., St. Giles, 1804–20.
Ogden, Thomas, admitted C.C. 1659.
 — **Jno.**, Bow Brigg, Yorkshire; long-case clock, 1681 (see p. 316).
Ogston and Bell, Davis St.; patented a watch with two barrels in 1826 (No. 5314). (See also Dwerryhouse.)
Okeham, Thomas, admitted C.C. 1632.
Oliver, Thomas, 17, Fleet St., 1780; 2, Brook St., Hanover Sq., 1790–1800.
 — **Jas.**; watch-case maker; died 1892, aged 76.

Olley and Clark, Poplar, 1817.

Ordson, William. In the Guildhall Museum is a verge watch by him, square pillars, enamel dial, the hours represented by letters forming the name "James Newman*," about 1720.

Orel, Thos., London; watch, 1770.

Orford, Robt., 71, Oxford St., 1795-1810.

Orme, Jno., Lancaster, 1712.

Orpwood, Richard, 7, Worship St., Finsbury, about 1800.

— **Geo.**, 58, Bishopsgate Within, 1810-40 (see p. 334).

Orr, Peter, 17, Myddleton Sq., 1840. He afterwards established a business at Madras.

Orton, Edward, admitted C.C. 1687.

— **William F.**, 5, York Rd., 1835.

Osborn, William, admitted C.C. 1700.

Osborne, Birmingham; on clocks, 1800-42.

Osmont, Jean B., 41, Strand, 1840; 6, Victoria Rd., Pimlico, 1842.

Otley, Thomas, 55, Piccadilly, 1823.

Oudin, Charles, Rue Vivienne, Paris, pupil of Breguet; maker of fine watches, and inventor of a form of keyless work (see p. 353).

Oughtred, Benjamin, admitted C.C. 1639; author of several books on mathematics, including "Clavis Mathematicæ." Derham speaks of him with admiration; 1639-80.

Overbury, Thomas, admitted C.C. 1688.

— **Hy.**, Overschie; repeating watch, 1718.

Overton, P., London; watch, 1835.

Overzee, Gerard, Isleworth (naturalized), admitted C.C. 1678; known as a maker of lantern and other clocks, 1670-90.

Ovingham, —; watch, Mr. R. T. Mole, London, h.m. 1819.

Owen, Ben, London, completed his apprenticeship 1694; maker of long-case clocks, 1694-1740.

— **William**, Cheapside, 1737-40.

— **Joseph**, 10, Helmet Row, 1800; 243, St. Margaret's Hill, 1810.

— **Richd.**, London; watch, 1830.

Oyens, Peter, London; long-case clock, about 1730.

Pace, Thomas, at the Crown in Fleet St.; maker of several small-sized lantern clocks, originally with balances (frets Fig. 305); 1630-60.

— **Jno.**, 19, Cock Hill, Ratcliffe, 1790-94.

— **Thomas**, 128, Whitechapel; a

well-known maker of bracket and long-case clocks, 1788-1840; watch by him, 1800.

Pace, John, Bury St. Edmunds; patented in 1833 (No. 6506) a night timepiece.

— **Edmund**, 21, Thavies Inn, 1840-42.

— **Chas.**, 128, Whitechapel High St., 1842.

— **Henry**, 11, Green Terrace, Clerkenwell, 1842; 35, King St., Cheapside, 1848-58.

Pacificus, Archdeacon, Verona; one of those to whom the invention of wheel and weight clocks is ascribed. Claim disputed by Dithmar; 850.

Pack, Richard, admitted C.C. 1712.

Packer, Wm., 376, Oxford St., 1840.

Pagars, Dan, 44, St. Martin's Lane, 1793.

Page, Joseph, admitted C.C. 1683.

— **Henry**, admitted C.C. 1713.

— **Thos.**, Norwich; watch, about 1750.

— **John**, 129, Strand, 1775-90; 8, Hind Court, Fleet St., 1794.

— **Wm.**, 17, Liquorpond St., 1815-18.

Paget, Ambrose, admitted C.C. 1728.

Pagnes, William, Butcher's Row, East Smithfield; maker of lantern clocks, about 1690.

Paillard, Baptiste; watch, 1760.

— **C. A.**, Geneva; inventor of palladium alloy non-magnetic balances and springs; died 1896.

Pain, William, admitted C.C. 1729.

— **David**; watch, gold-chased case, about 1735.

— **Thomas**; known as a maker of long-case clocks, about 1780.

Paine and Balleston, 5, Banner St., 1840.

— **John P.**, 39, High St., St. Giles's; received in 1826 a silver medal from the Society of Arts for a method of illuminating dials, 1826-40.

Pairas, Charles, Blois; two octagonal watches by him, S. K. M., about 1605; on one in the Salting collection the name is spelt Perras.

Palfrey, John, admitted C.C. 1654.

Palmer, Robert, liveryman, C.C. 1776.

— **Thomas**, Fetter Lane, liveryman C.C. 1776.

— **William**, Shoe Lane, liveryman C.C. 1776.

— **Thomas**, 132, Lower Holborn, 1783-1810.

— **Samuel Richd.**, gold watch-case maker, 2, Red Lion St., 1790-1810.

— **Joseph**, 112, Whitechapel, 1814-18.

— **B.**, 21, King St., Covent Garden, 1830.

- Palmer, John**, 58, Great Marylebone St., 1825-35.
- **Robert**, 24, White Hart Place, Kennington, 1832-42.
- **Hy.**, 25, Buttesland St., 1842.
- Pamer, Edward**, London; watch, 1802, another, 1826.
- Pamphillon, William**, C.C. 1725.
- Panchard, Abel**, Oxford St., 1765-80.
- Panchaud, David**, 202, Oxford St., 1790-1825; livery C.C. 1802.
- **and Cumming**, 202, Oxford St., 1806-10.
- Panier, Jossué**, Paris; clock S.K.M., 1725.
- Panther, B.**, London; watch, 1785.
- Pantin, Lewis**, 45, Fleet St., 1770-75; 62, St. Martin's-le-Grand, 1800.
- Papanoine, Isaac** (French), Duke's Court; admitted C.C. 1687; maker of long-case clocks, 1680-1710.
- Papon, Leonard**; watch B.M., about 1620.
- Papworth, John**, admitted C.C. 1688.
- Paradise, John**, admitted C.C. 1716.
- **John**, 13, Newcastle St., Strand, 1823.
- Parbury**. This name is on a very fine *repoussé* gold watch case in the Mainwaring collection.
- Pare, Thos.**, London; clock, long marqueterie case, about 1700.
- Paris, M.**, Rennes; watch B.M., about 1620.
- **John**, watch engraver, 7, Dean St., Fetter Lane, 1790-94.
- Parish, Simon**, admitted C.C. 1723.
- Park, Nicholas**, admitted C.C. 1641.
- Parker, Thomas**, "in St. Ann's Lane, neere Aldersgate, fecit," inscribed on a lantern clock; admitted C.C. 1669.
- **John**, admitted C.C. 1674; John Pinson was his apprentice in 1677.
- **John**, admitted C.C. 1678.
- **Robert**, apprenticed to J. Markwick; admitted C.C. 1698.
- **John**, admitted C.C. 1706.
- **Thos.**, Dublin, about 1750.
- **and Wakeling**, Pantion St., 1760-75.
- **John**, 55, St. Paul's Churchyard, 1769-75; Parker and Son, 1794.
- **Thos.**, 15, Wilderness Row, 1788.
- **Thos.**, 37, Berners St.; watch, h.m., 1786; 1786-1817.
- **and Birketts**, 16, Prince's St., 1804.
- **John**, High St., Marylebone, 1793; 2, Rathbone Place, 1804.
- **James**, 17, King St., Clerkenwell, 1835.
- Parkes, Jno.**, Old Change, 1800.*
- Parkhouse, Roger**, Richmond, Yorks, 1730.
- Parkinson, Lancaster**; Wm., 1708; Robt., 1732; Wm., 1789.
- **Francis**, London; watch, 1788.
- **Wm.**, and **Frodsham**, 4, Change Alley, 1806-42.
- **James**, 4, Cross St., Goswell Rd., 1820.
- **Henry**, 50, Great Sutton St., 1835; 21, Red Lion St., Clerkenwell, 1842.
- **James**, 70, Red Lion St., Clerkenwell, 1842.
- **and Bouts**, Gracechurch St., 1860 (see Bouts).
- Parkwick, Jas.**, assistant C.C. 1698.
- Parnell, Thomas**, High St., Bow, 1815-42.
- Parquot, P.**, London; watch, 1706.
- Parr, Thos.**, 27, Cheapside, 1735-75.
- **William**, 20, Strand, watches by him from 1790 to 1808. In 1804 he published a "Treatise on Pocket Watches."
- **Edward**, apprenticed to Jas. Plumby, 16, New Cavendish St., 1824.
- Parsons, Richard**, 54, Goswell St., admitted C.C. 1690; maker of bracket and other clocks, 1690-1720.
- **John**, admitted C.C. 1696.
- **John**, 8, St. Martin's Court, 1775.
- **and Horne**, Castle St., Holborn, 1825.
- Parten, William**, admitted C.C. 1720.
- Parter, William**, admitted C.C. 1692.
- **Francis**, admitted C.C. 1730.
- Partington, J.**, High St., Marylebone, 1790.
- **C. F.**, author of *Clock and Watch-makers' Complete Guide*, 1826.
- **William**, 53, Paddington St., 1815-42.
- Partridge, Wm.**, gave a silver spoon to C.C. prior to 1652.
- **Joseph**, Bartholomew Close, 1760-63.
- **C.**, 13, Wentworth Place, Mile End Road, 1840-42.
- Pascal, Claude**, à la Haye, on a splendidly decorated watch, about 1650.
- Pashler, Edwd.**, Bishopsgate St., 1774.
- Large ebonised case, bracket clock, tunes at the hour. Psalm 104, March in Rinaldo; air, Duke of Cumberland's Minuet; March in Scipio, "Britons, Strike Home." In addition to the tunes plays "runs" at the 1st, 2nd, and 3rd quarter. Dial figures in Turkish characters; "strike and silent," "chime and silent," engraved back plate, brass arched

- dial, 10 bells and striking-bell. Had formerly crown escapement. Bought in the Bazaar at Constantinople in 1881.
- Passanine, Isaac**, Duke's Head Court, Cannon St., maker of long-case clocks, about 1770.
- Passement, Admiral**, designer of equation and astronomical clocks, about 1750 (see p. 279).
- Passevant, Wm.**, 10, Red Lion Passage, 1793.
- Pasteur, Jacques**, Geneva, about 1780.
- Patching, Elisha**, C.C. 1728.
- Patey, Wm.**, maker of a verge watch movement in the Guildhall Museum, enamel dial, period about 1760.
- Patmore, Peter**, Ludgate Hill, C.C. 1813.
- Patrick, Edwd.**, London, maker of long case clocks, about 1690.
- **John**, admitted C.C. 1712.
- **Miles**, Greenwich, cylinder watch, 1790.
- Pattee, Thomas**, Mile End Rd., livery C.C. 1810.
- Patterson, Robert**, C.C. 1668.
- **George**, 16, King St., Seven Dials, 1835.
- Patru**, —, watch, B.M., about 1620.
- Paul, Nowell**, alien, threatened with prosecution for working as clock-maker within the liberties of C.C., 1668.
- **Thomas**, admitted C.C. 1670.
- Paule, Philip**, 15, Cleveland St., Fitzroy Sq., 1810-23.
- **George**, 15, Cleveland St., 1830-35.
- Paulet**, —, London; maker of a watch at S.K.M., 1703; also repeating watch, 1728.
- Paulin, Lewis**, 45, Fleet St., 1772.
- Pay, C.**, London; repeating watch, 1730.
- Payn, John**, Southwold, a smith, received 6s. 8d. for a new clock from the churchwardens of Walberswick, Suffolk, 1451.
- Payne, Nicholas**, assistant C.C. 1671.
- **H. and John**, 44, Cheapside, 1753-75.
- **Southern**, Bridgewater Sq., livery C.C. 1766, master 1778.
- **Richd.**, London; watch, 1785.
- **J.**, 17, Foster Lane, 1794; 18, St. Ann's Lane, Aldersgate, 1800-25.
- **Robt.**, Waltham, 1813.
- **Wm.**, 62, South Moulton St., 1816; 39, High St., Bloomsbury, 1825; 163, New Bond St., 1830-50. In 1849 he patented (No. 12,516) musical clocks.
- Payton, Wm.**, watch-case maker, 3, Addle St., Wood St., 1790-94; a watch inscribed "Notyap, London," probably by him.
- Peachey, Newman**, 12, Dean St., livery C.C. 1766; 1760-78.
- Peachy, William**, admitted C.C. 1727.
- Peacock, George**, 65, Threadneedle St., 1769-75.
- **Geo.**, 4, Sweeting's Alley, 1778-81
- **Samuel**, 30, Old Exchange, 1793.
- Pearce, Adam**, admitted C.C. 1664.
- **Jno.**, Newgate St., 1753-60; Pearce and Newton, 1760-63.
- **William**, livery C.C. 1787, master 1804.
- **John**, 101, Gt. Peter St., Westminster, 1835-40.
- Pearkes, F.**, 15, St. Martin's Court, 1823.
- Pearne, Wm.**, 11, Leicester Sq., 1793.
- Pearse, John**, Newgate St., 1753-50.
- Pearson, Mary**, 31, Fleet St., 1772-75.
- **The Rev. W., LL.D., F.R.S.**, East Sheen, 1811; South Kilworth, Leicestershire, 1821; author of the splendid treatise on horology which appeared in Rees' "Cyclopædia," published in 1791 and revised in 1819; died 1847, aged 80.
- **and Price**, 11, Gt. Sutton St., 1830.
- Peatting, Thomas**, C.C. 1682.
- Peck, George**, admitted C.C. 1725.
- Peckett, John**, admitted C.C. 1691.
- Peckham, Henry**, Bernondsey. He patented in 1798 (No. 2280) the application of a compass to a watch.
- Peckover, Richard**, Change Alley, Cornhill, known as a maker of long-case clocks and repeating watches. He probably succeeded Quare and Horsemans, 1737-56.
- Peere**, —, admitted C.C. 1654.
- Peers, Chester**. A noted family of clockmakers from about 1745-1840.
- Peiras, Pasquier**, Blois; oval watch, 1590.
- Peirson, Worthy**, 92, Whitechapel High St., 1840.
- Pelleter, Solomon**, 14, Broad St., 1775.
- Penfold, Joshua**, admitted C.C. 1695.
- **Miles**, 115, Newgate St., 1769-75.
- Penkethman, Thomas**, C.C. 1692.
- Penn, Richd.**, London; watch, 1780.
- Pennington, Christopher**, Kendal; watch, 1780.
- **Robert**, chronometer maker, Camberwell; invented an improved form of sector, 1780-1816.
- **Robert, and Son**, 11, Portland Row, Camberwell, 1832-42. John Pennington, the son referred to, afterwards succeeded Grohe, at Wigmore St.
- Pennock, John**, Lothbury, C.C. 1638, master 1660; gave a fine house clock

- of his own make to the Company in 1652; on a lantern clock by him, dating from about 1640, is the address "Within Bishopsgate."
- Penny, Richard**, London; watches, 1695-1715.
- Penton, Charles**, Upper Moorfields, 1760-75.
- Pepper, Thomas**, 5, George St., St. Martin's, livery C.C. 1787; 1776-94.
- Peppin, Sam.**, 22, Greville St., Hutton Garden, 1517.
- Pepys, Richard**, admitted C.C. 1674.
- **John**, admitted C.C. 1680, master 1707. There is a watch by him in the B.M.; other examples are occasionally met with, 1680-1708.
- **John, junior**, Fleet St., admitted C.C. 1715, master 1739.
- **William**, admitted C.C. 1723.
- Perchard, Matthew**, Cannon St., 1753-59.
- **Peter**, 15, Abchurch Lane, 1760-72.
- Percival, N.**, 36, Old Bond St., 1798-1800.
- **Thos.**, 36, Old Bond St., 1804.
- **M.**, Woolwich, 1817.
- Perdra, Wm.**, London; watch, 1805.
- Peres, Mark**, admitted C.C. 1680; large lantern clock with two bells, about 1700, inscribed Marcos Péres, London.
- Perier, H.**, London; watch, 1812.
- Perigal, Francis**, 9, Threadneedle St., Royal Exchange, the first of a family of able horologists. Excellent watches and clocks of their make are to be met with; master C.C. 1756 and 1775; 1740-80.
- **Francis, junior**, Royal Exchange; apprenticed to his father 1778; livery C.C. 1787. (See Francis Perigal and Son, below.)
- **Francis and Son**, 9, Royal Exchange (Francis S. Perigal, junior, master C.C. 1806), 1790-1808.
- **Francis**, watchmaker to the king, 37, New Bond St.; hon. freeman C.C. 1781; 1770-94.
- **John**, 12, Coventry St., Haymarket; hon. freeman C.C. 1781; 1770-1800.
- **and Browne**, 11, Coventry St., Piccadilly, 1794-1800.
- **and Duterrau**, "Watchmakers to His Majesty," 62, New Bond St., 1810-40.
- **Jno.**, 55, Prince's St., Soho, 1810.
- **Thos.**, London; watch, 1812.
- Perinot, Abraham**, known as a maker of long-case clocks, about 1780.
- Perin, Chas. Henry**, George Yard, Lombard St.; {patented winding work in 1842 (No. 9438).
- Perins, John**, 193, Strand, 1750-94.
- Perkin, R.**, 55, Tooley St., 1790.
- Perkins, Eysum**, of "Rederiffe, the end of Love Lane," threatened with prosecution by C.C. for exercising the art, not being admitted; he promised to take up his freedom at the next quarterly court, 1682.
- **James**, admitted C.C. 1730.
- **and Spencer**, 44, Snow Hill, 1765-74.
- **Vineyard**, 53, Dorset St., Salisbury Sq., 1793.
- Pernell**, —, London; 30-hour long-case clock, about 1730.
- Perras**. (See Pairas.)
- Perrenoud, F.**, 192, Brick Lane, Whitechapel, 1810.
- Perrier, Peter**, maker of a silver watch, the back plate covered with representation of crucifixion, about 1680.
- Perring, H.**, 179, Great Surrey St., 1830.
- Perringham, Francis**, back of Exchange, 1790.
- Perron, Richd.**, 7, Worship St., 1790-94.
- Perry, Henry**, admitted C.C. 1691.
- **Thos.**, London; watch, about 1790.
- **John**, 40, Oxford St., 1835-42.
- Peterkin, John**, 25, Cleveland St., 1810-40.
- Peterman and Debois**, watch-case makers, Bateman's Buildings, Soho Sq., 1800-10. (See Comtesse.)
- Petit, Guillaume**, petitioner for incorporation of C.C., 1630; gave a silver bowl to the Company in 1656.
- **William**, admitted C.C. 1632.
- Peto**, —, prohibited from working by C.C. in 1632.
- , —, London; spoken of by Earnshaw as a capital workman, 1780-1800.
- Petter, Christopher**, C.C. 1730.
- Pettit**, —, 54, Bethnal Green Rd., 1835.
- **Isaac**, 22, Fieldgate St., Whitechapel, 1835.
- **Eliza**, 22, Fielding St., Whitechapel, 1840-42.
- **William**, 7, New Rutland St., 1840.
- Petty, William**, admitted C.C. 1646.
- Pewtress, Thomas**, Gracechurch St., 1753-56.
- Pfaff, Jeremas**, Augsburg; fine table clock by him, which is provided with an alarum, and repeats the hours, quarters and minutes. There are, besides the barrel and fusee for the going part, four barrels, four

hammers and three bells, the largest bell serving for the hour and for the alarum. The cocks and hammers are beautifully engraved, and the work throughout is excellent. The dial ring is about five inches diameter, having within it the alarum disc. The case is square, measuring seven inches across and three inches in height besides the feet. In each of the four sides of the case is a glass panel. It dates probably from the end of the seventeenth century.

Phélisot, —, Dijon; crystal case watch, about 1560.

Phelps, Richard, founder of the great bell for Bradley's St. Paul's clock (see p. 210), 1716.

Philcox, George, 24, Great Dover St., Borough, 1835; 22, Southwark Sq., 1842. He spent his life in endeavouring to improve timekeepers by various inventions in connection with escapements and compensation; died in Watchmakers' Asylum, New Southgate, 1878.

Philip, Robert, musical clockmaker, 6, New Court, St. John St., 1779-88 (Robert Philip on some watches).

Phillipe, Adrien, a leading Swiss horologist, partner in the firm of Patek, Phillipe & Co., Geneva; inventor of shifting sleeve keyless work; died 1894, aged 79.

Phillips, Philip, 10, St. John's Sq., 1790-1800.

— **Joel**, 35, Norton Folgate, 1820.

— **P.**, 19, Crown St., Finsbury, 1830.

— **Abraham**, 33, City Rd., 1835.

— **John**, Coldbath Fields, 1817; 91, Goswell St., 1835.

— **Joseph**, 55, Belvedere Place, Boro' Rd., 1835.

— **Brothers**, 31, Cockspur St., 1839-42.

— **James and Charles**, 25, Coppice Row, Clerkenwell, 1835-40.

— **P.**, 15, Bury St., 1840-42.

— **P.**, 3, Steward St., Spitalfields, 1840-42.

Phillipson, Thos., London; watch, 1815.

Phipps, James, 40, Gutter Lane, 1783.

Phylander, Sylvanus, maker of a pair-case silver calendar watch, h.m. 1772.

Pickett, William, 32, Ludgate Hill, 1768-72; succeeded Thead and Pickett.

— **and Rundell**, 32, Ludgate Hill, 1775-83; afterwards Rundell and Bridge.

Pickman, Wm., 57, Dean St., Soho,

1816-25; 6, Albany St., Regent's Park, 1835.

Pierce. In Berkeley churchyard is the following quaint epitaph:—

Here lyeth Thomas Pierce, whom no man taught,

Yet he in iron, brass, and silver wrought;
He jacks and clocks and watches (with art) made,

And mended too, when others work did fade.
Of Berkeley five times Maior this artist was,
And yet this Maior, this artist, was but grasse!
When his own watch was down on the last day,
He that made watches had not made a key
To winder it up; but useless it must lie
Until he rise again, no more to die.

Thomas Pierce, five times Mayor of this Towne, died Feb. 25, 1665, aged 77.

Pierre, Le Queux; clockmaker to the Duke of Orleans, 1396.

— **Pasquier**, admitted C.C. 1648.

Pierret, Victor A., Paris; noted maker of complicated watches; born 1806, died 1893.

Pigott, Henry, admitted C.C. 1687.

Pike, John, steward C.C. 1838; verge watch movement by him in the Guildhall Museum, 1830-40.

— **and Green**, 48, Bunhill Row, 1806; Bartholomew Sq., 1820-30.

Pilkington, J., Woolwich, 1815.

— **R. J.**, London; bracket clock, about 1760.

Pilon, Germain, Paris; cruciform watches, about 1590.

Pilson, Abraham, Plymouth; watch, about 1700.

Pinard, Paul, 2, New St., Covent Garden, 1775.

Pinchbeck, Christopher, Clerkenwell and Fleet St.; a clever maker of musical clocks and of watches; inventor of Pinchbeck alloy (see p. 222); 1690-1732.

— **Edward**, Fleet St., son and successor of the above (see p. 223); 1732-66.

— **Christopher**, son of the above-named Christopher, Cockspur St.; died 1783, aged 73 (see p. 225).

Pinckney, W. "There was a watch found some time past near the Temple Gates, which was made in London by a Frenchman. If any person lay claim unto it, so as to describe the same, they may have it at Mr. W. Pinckney's, a goldsmith, near the Inner Temple" (*London Gaz.*, March 2-6, 1675).

Pine, (Philip), 20, Aldgate, 1779-82; card B.M.

Pinfold. (See Penfold.)

Pinhorne, —, Portsea; quarter clock, about 1800.

- Pink, J.**, London; watch, h.m. 1767.
Pinkerton and Miller, 20, Percival St., 1842.
Pinson, Jno., apprentice of Jno. Parker, London, 1677.
Piolaine and Co., 67, Great Russell St., 1815-25.
Pipes, John, London; maker of long-case clocks, about 1750.
Pipps, Jno., London; watch, about 1790.
Piquet, a Rennes; watch, B.M. 1700.
Pistor, Edward, 116, Leadenhall St., and 105, Strand, 1764-90.
 — **Edwd. and Jno.**, 116, Leadenhall St.; watch, musical clock, and organ makers, 1793-98.
Pitcher, John, admitted C.C. 1689.
Pitkin, H., Hartford, Connecticut, U.S.A. Watches by him, engraved with the American flag, were made in 1838.
Pitman, John, admitted C.C. 1714.
Piton, James, admitted C.C. 1710.
Pitson, Chas., London; watch, about 1700.
Pitt, Thyar, 24, Great Bush Lane, livery C.C. 1787; maker of a musical clock playing every three hours; 1770-94.
 — **David**, Hampstead; watch 1780.
 — **William**, livery C.C. 1787.
 — **Caleb**, 292, Oxford St., 1790; 43, Duke St., 1800-30.
 — **Chas.**, 152, Sloane St., 1835-40.
 — **John**, 37, Crown St., Finsbury, 1830-42.
 — **W. G.**, 25, Thyar St., Manchester Sq., 1840-42.
 — **J.**, Kingsland Rd., 1842.
Pittit, Jno., Bethnal Green Rd., 1817.
Pittney, Thos., Featherstone St., 1769-72.
Plaire. (See Player.)
Planck, Anthony, Fleet St., 1760-72.
Plankh, Nicholas, Augsburg; clock by him Vienna Treasury, about 1580.
Planner, Thomas, C.C. 1701; 1730.
 — **Thomas**, admitted C.C. 1730.
 The Planners were known as makers of long-case clocks; 1730-45.
Plant, Edward, admitted C.C. 1664.
Plaskett, Reuben, Raven St., Whitechapel; died 1845, aged 80.
 — **Jas.**, West India Dock Rd.; died 1860.
Plate, Richard, 58, Carey St., Lincoln's Inn, 1835.
Platt, Edward, 33½, Wilderness Row, Clerkenwell, 1835.
Player, Thomas, admitted C.C. 1672.
 "A silver watch in the form of 5 crowns, a Flower-de-Lis under each crown, with a Knot, in the middle the name *Thomas Plaire, Londini*; the hours engraven in a six-square, with a chain and 5 wheels" (*Lond. Gaz.*, March 29, April 1, 1680).
Player, Robert, admitted C.C. 1700; maker of a walnut long-case clock, arch dial, 1700-40.
 — **H. J.**, 2, North Place, Gray's Inn Lane, 1820-40.
Pleverie, Isaac, admitted C.C. 1652.
Pleydell, Jno., London; long marqueterie-case clock, square dial, about 1720.
Pluett, Anthony, admitted C.C. 1697.
Plumbly, Jas., 16, New Cavendish St., 1820; Plumbly and Tupman, 1824; Plumbly and Parr, 1840-42.
Plumley, William, 43, Ludgate Hill; apprenticed to Lawrence Mace; admitted C.C. 1756; master, 1779.
 — **Wm.**, 43, Ludgate Hill, son of the preceding; C.C. 1780; livery, 1797; master, 1801; 1780-1825; retired to Shepton Mallet.
 — **Chas.**, 231, Strand, 1835-42.
Plummer, Wm., 43, Gutter Lane, 1793.
Plumper, Thos., London; watch, 1760.
Plunkeld, Richard, 8, Fieldgate St., Whitechapel, 1820.
Pohlmann, Peter, Leadenhall St., maker of long-case clocks, 1760-75.
Poidevin, F., 16, Brewer St., 1830.
Poisson, Henry, London; long-case marqueterie scroll-work clock S.K.M., period Queen Anne; also silver watch of a slightly later date; 1695-1720. (See Fish.)
Poite, Jaques, Blois; watch case enamelled by him, Vienna Treasury, about 1720.
Pomeroy, Joseph, admitted C.C. 1728; horn-covered pair-case verge watch by him about 1738.
Poncy, J. P. I., Well St., patented in 1840 (No. 8602) a clock with two springs.
Poney, Abraham, 82, Wells St., Oxford St., 1840-42.
Ponson, Richd., London; watch, 1810.
Pool, J. C., St. Anne's Lane; made a clock for the Mayor of Kendal as a gift to that town. On the dial was the motto, "Time runneth. Your work is before you," 1654.
Poole, Jno., London; arch top bracket clock, about 1712.
 — **Robert**, Aldersgate St.; livery C.C. 1766; master, 1781; 1760-81.
 — **and Bickerlo**, 88, Bartholomew Close, 1769-75.
 — **George**, 88, Bartholomew Close, 1783-85.

Poole, John, 36, Charles St., City Rd., 1822; 7, Brunswick Terrace, Commercial Rd., 1835-40.

— **John**, born 1818, died 1867; 7, Brunswick Terrace, Commercial Rd., in 1842, afterwards in Fenchurch St. A clever chronometer maker, and inventor of an auxiliary compensation.

Pools, Edmonde, admitted C.C. 1722.

Pope, Thos., Wharton's Court, Holborn, 1793.

Portal and Coyle, Ludgate Hill, 1760-63.

— **Abraham, and Gearing**, 34, Ludgate Hill, 1769-75.

Porter, Chas., 227, Bermondsey St., 1835-40.

Porthouse, Thomas, High St., Poplar, 1815-30; 10, Northampton Sq., Clerkenwell, 1840; treasurer, W. and C. Bene. Inst., died 1860.

Post, William, 42, Fish St. Hill; watch, 1760; liveryman C.C. 1776.

Potter, George, watchmaker, and Mayor of Coventry, 1727.

— **Harry**, 5, Well St., Aldersgate, master C.C. 1795, and again in 1812, when he died before the expiration of his year of office; 1775-1812; a watch by him exhibited at the Guelph Exhibition by Mr. Geo. Carr Glyn, had an outer case embossed by Maweis.

— **James**, livery C.C. 1810.

Pottinger, Jno., 6, Bell's Buildings, Salisbury Sq., 1793.

Pouchoulin, J. L., Geneva, 1750.

Poulson, Thos., London; watch, 1815.

Poulton, R., 2, Mayfield Place, High St., Kennington, 1840-42.

Pow. (See Poy.)

Powell, Bartholomew, C.C. 1668.

— **Robert**, admitted C.C. 1710.

— **H.**, 56, St. Paul's Churchyard, 1793.

— **James**, 7, Prince's St., Leicester Sq., 1828-35.

Powis, Robt., 36, Rosoman St., 1806-23.

Poy, Godfrie; a choice, small pull-repeating and alarum clock by him, said to have been made for George II. when Prince of Wales. Gilt case with military emblems over the arched top surmounted by a handle; silvered dial, in the arch strike-silent plate marked "Schlaaf, Nit schla"; engraved back plate; bell at the bottom of the movement. Also maker of a very fine quarter repeater, inner case pierced and *repoussé*, h.m., 1729, outer case shagreen; another of his productions

is a black, pull-chime bracket clock; 1718-30.

Poy, Godfrey, 78, Mortimer St., 1785-95.

Pratt, Smith, and Hardy, 82, Cheap-side, 1793.

— **Chas.**, 30, Camdeu St., Islington, 1830-35.

Preddy, Wm., Taunton. In 1849 he patented (No. 12,656) a sliding plug for watch-keys.

Preist, Wm., corner of Lad Lane, Wood St., 1763.

Prentis, Daniel, 25, Charterhouse Lane, 1788-96.

— **and Son**, 25, Charterhouse Lane, 1804-7. John Prentis, same address, 1817.

Prerie, Humphrey, C.C. 1653. —

Presbury and Son, 9, New St., Covent Garden, 1804.

Presciot, Peter, New Rents, St. Martin's-le-Grand, 1790-94.

Prest, —, Fleet St., 1774.

— **Thomas**, Chigwell, Essex; patentee of keyless action for watches (No. 4501, 1820). Prest was foreman to J. R. Arnold (see p. 353).

Prestbury, Chas., 9, New St., Covent Garden, 1793.

Prestige, Bartholomew, C.C. 1703.

Preston, Edward, C.C. 1721.

Prestwood, Joseph, admitted C.C. 1703; maker of long-case clocks, 1703-20.

Prevost, Ni., London; watch, 1730.

— **L. N.**, London; watch, 1750.

— **Adolphe**, 20, King St., Soho, 1840-42.

Price, George, St. Martin's Churchyard, 1788; 89, Oxford St., 1793-1806.

— **W.**, 17, Maiden Lane, Wood St., 1825.

Prickett, G. J. B., a noted maker of gold and silver dials, 5, Corporation Row; died 1898, aged 71.

Priddith, John, admitted C.C. 1639.

Prideaux, Edmund, 31, Hatton Garden, 1780-94.

Pridham, William, Great Alie St., Goodman's Fields, 1760-63.

Priest, Thomas, admitted C.C. 1729.

— **W., and James**, 30, White Cross St., 1768-72.

—, —, Fleet St., 1774.

Priestman, M., 19, Prince's St., Leicester Sq., 1817.

Prigg, Matt., London; watch, 1750.

— **John**, Bethlehem, liveryman C.C. 1776; 1766-1777.

— **and Ansell**, clock and watch-spring maker, Middle Moore Fields, 1781-94.

Priggin, Wm., Hull. Mr. Thos. Boynton has a mahogany long-case clock by him about 1770, brass and silvered dial, 13 inches in diameter, shows the phases of the moon, time of high water, and days of the month.

Prime, Andrew, admitted C.C. 1672; lantern clock S.K.M.

Prince, Richard, admitted C.C. 1680. —, —, Hammersmith; watch, 1835.

Pringle, Thos., Dalkeith, 1810-30.

Print, Richard, admitted C.C. 1698.

Pror, George, 31, Prescott St., Goodman's Fields, 1765-88; Rosomond's Row, 1794.

— **George**, 5, George Yard, Lombard St., 1798-1810.

— **John**, Nessfield, near Skipton-in-Craven Yorkshire, received the following rewards from the Society of Arts: 1798, 30 guineas for detached escapement; 1803, 30 guineas for improved striking work; 1805, silver medal and 20 guineas for an alarum; 1811, silver medal and 10 guineas for striking work; 1817, silver Isis medal and 2 guineas for striking work; 1820, large silver medal and 20 guineas for striking work.

— **George**, son of the above, of Otley and Leeds. In 1809 he received from the Society of Arts a silver medal and 25 guineas for a clock escapement, and in 1811, 20 guineas for a remontoire escapement. In 1818 he patented (No. 4214) a remontoire. In the Yorkshire Directory for 1822 he is described as of Woodhouse Lane, Leeds, but he afterwards removed to City Rd., London, and became reputed as a maker of watches for the Turkish market.

— **Edward**, also a maker for the Turkish market contemporaneously with the last-named George, carried on business in Clerkenwell at first alone, and afterwards in partnership with Wm. Chambers.

— **I. W.**, Newington Causeway, 1830.

Procter, Wm., livery C.C. 1810.

Prosser, William, Strand, 1769-72.

— **John**, 61, Piccadilly, 1822-30.

Pryme, Andrew, C.C. 1647.

Pryor, Robert, 254, Tottenham Court Rd., 1835-40.

Puckridge, J., 73, Snow Hill, 1716-40.

— **Charles**, Goldsmiths' St., Shoe Lane, 1788-94.

— **John**, 72, Snow Hill, 1790-1818, livery C.C. 1814.

— **Alfred**, 7, Orange St., Bloomsbury, 1840-42.

Pugh, Ellis, Cockspur St., 1775-94.

Pugh, Benj., watch gilder, 34, Jewin St., 1790-94.

Puiguer, —, London; watch, about 1780.

Puller, Jonathan, admitted C.C. 1683, assistant 1705.

"A large House-Clock supposed to be stolen 16 or 18 months since is now in the hands of Jonathan Puller Clockmaker in Red Lion Court in Fleet St." (*Lond. Gaz.*, July 24-28, 1690).

Purnell, J., 106, Up. Seymour St., 1842.

Purrier, Richard, admitted C.C. 1705.

Purse, William, 336, Strand, 1804.

— **George**, 487, Strand, 1804-25.

— **and Catchpole**, 120, Regent St., 1835.

Purton, Francis, 2, Carey St., 1793.

Purvis, Alexander, 4, North Audley St., 1825-42.

Putland, G. and J., 287, High Holborn, 1793.

Putley, Francis, 40, Newington Causeway, 1806-42, livery C.C. 1812.

Puzzy, Isaac, London, maker of a twelve-hour lantern clock, about 1625.

Pybus, William, 66, Threadneedle St., 1789-94.

Pyke, John, watch motion maker, Bedford Row, 1700-20. Centre seconds watch by John Pyke, London, 1770.

—, —, High St., Eltham, 1820-42, an excellent maker, formerly foreman of Arnold.

Pyne, Nathaniel, admitted C.C. 1677.

Quaife, Thos., Battle, Sussex. In 1853 he patented (No. 1140) forming watch cases by pressure.

Quare, Daniel, St. Martin's-le-Grand; afterwards at the King's Arms, Exchange Alley; born 1649, admitted C.C. 1670, master 1708, died 1724; a celebrated maker, inventor of the repeating watch (see p. 189).

Quare and Horseman, at the King's Arms, Exchange Alley, 1700-30. (See Peckover.)

Quari (or Quarie), London. Table-clock in engraved brass case, about 1700, S.K.M., inscribed "De Jean Quari, London."

Quelch, John, admitted C.C. 1646; known as a maker of lantern clocks, 1646-66.

— **Richard**, Oxford; octagonal watch, Whitcombe Greene collection, about 1670.

Quick, Thos., London; watch, 1780.

Quin, T. D., 18A, Great Titchfield St., 1840.

Quinton, Stephen, London, maker of long-case clocks, about 1750.

Radford, Henry, admitted C.C. 1721.

— **Jas.**, 75, Gray's Inn Lane, 1793.

Rafford, F., London; watch, 1780.

Ragsdale, George, 25, New Bond St., 1769-83.

Raiment, Thomas, C.C. 1719.

Rainaldi, Giovannia P.; maker of the first clock in the square of St. Mark, Venice, 1495.

— **Carl**, son of the foregoing; assisted his father.

Raines (Raynes), William, Butcher Row, East Smithfield; admitted C.C. 1660; maker of lantern clocks.

Raingo, —, Paris; orrery clock, Windsor Castle, about 1780; a similar one in the Soane Museum.

Rainier, John, livery C.C. 1787.

Rainsford, Francis, Charing Cross; admitted C.C. 1689.

— **Jno.**, London; Mr. Thos. Boynton has a clock by him, brass and silvered dial, engraved laurel border, chimes quarters on six bells, shows days of the month, about 1720.

Raitt, Alexander, London; maker of long-case clocks, with striking racks between the plates; 1690-1720.

Raker, P., 95, Bishopsgate St., 1775.

Rallart, —, Paris; watch, 1630.

Rambley, Wm., 407, Oxford St., 1775-94.

Rambrant, Jas., London; watch, 1805.

Ramsay, David, near Temple Bar, watchmaker to James I.; first master of the C.C. (see p. 158); 1600-50.

—, —, Islington, 1800-8.

Ramsden, Thomas, admitted C.C. 1648.

Ranceford, Bernard, C.C. 1677.

Rand, Wm., London; repeating watch, 1760.

Randall, John, Wine Office Court, Fleet St., 1790-94.

Ransom, M., London; watch, 1802.

— **George**, 18, King St., Soho, 1825.

Rant, John, admitted C.C. 1687.

— **Jonathan**, admitted C.C. 1687.

Ranzonet, The Sieur, Nancy; said to have made a musical watch in 1770.

Raphard, —, London; watch, gold case, Schloss collection, 1760.

Rapson, Thos., 4, Montague St., Portman Sq., 1814-18.

Ratcliffe, J., 45, Clerkenwell Close, 1835.

Ratherain, C., 25, Cursitor St., 1825.

Raven, Crispin, London; long solid walnut-case clock, about 1780.

Rawford, James, 75, Gray's Inn Lane, 1770-90; livery C.C. 1787.

Rawlings, Charles, Brook St., Holborn; admitted C.C. 1818, livery 1826; died 1864.

— **George**, 88, Whitechapel, 1790.

Rawlins, Henry, admitted C.C. 1706.

— **James**, livery C.C. 1787.

— **Geo.**, 85, Whitechapel, 1793.

Ray and Montague, 22, Denmark St., Soho, 1804-19.

— **Samuel**, 35, Great Castle St., Oxford St., 1820-30.

— **Henry**, 3, Commercial Place, City Rd., 1835; 22, Great Russell St., 1840.

Rayley, Jno., London; watch, 1830.

Rayment, Thos., London; watch, *repoussé* gold case, Mr. A. Schloss, about 1780; another painted tortoise-shell case, Mr. R. T. Mole, about 1785.

Raymond, Jno., Leadenhall St., 1774.

Rayner, John, London; C.C. 1697; watch, h.m. 1727.

— **Step.**, London; watch, S.K.M., about 1750.

Raynesford, Benjamin, C.C. 1709.

Read, George, Old Sq., Lincoln's Inn, 1820.

— **Wm.**, Newcastle Place, Clerkenwell, 1820.

— **Geo.**, 10, Rotherhithe St., 1815-25.

— **William**, 84, Jermyn St., Piccadilly, 1825.

Reader, J., London, 1825.

Recordon, Louis, Greek St., Soho, 1780; afterwards succeeded Emery at 33, Cockspur St., Charing Cross. In 1780 he patented (No. 1249) a pedometer-winding for watches (see p. 355); 1778-1810. (See Desgranges.)

Red, Cr., London; watch, 1783.

Reed, Alexander, admitted C.C. 1706; clock watch, Schloss collection, about 1710.

Redier, Antoine, Paris; born 1717, died 1792.

Reed, Thos., C.C. 1632.

Reeve, Thomas, in Pope's Head Alley, admitted C.C. 1648, assistant 1655.

— **Henry**, admitted C.C. 1682.

— **John**, admitted C.C. 1712.

— **Jarvis**, admitted C.C. 1731.

— **Wm.**, 24, Ludgate St., 1830; 13, Vigo St., Regent St., 1835.

Reeves, Wm., 37, Newington Causeway, 1825-42.

— **Richard**, 208, High St., Shore-ditch, 1820-42.

Regard, Reymond, clockmaker at the upper end of Russell St., near Drury Lane; admitted C.C. 1677; mentioned in *Lond. Gaz.*, Jan. 25-28, 1691.

- Regnault**, —, Chalons, France; devised a compensated pendulum, 1833.
- Regnier**, "**Maitre**," Paris, 1605.
- Rehle**, —, Freiburg; table clock, about 1690.
- Reid and Auld**, Edinburgh; makers of a fine regulator at the Horological Institute, 1790-1820.
- **J.**, London; watch, 1812.
- **Wm.**, 32, Rosoman St., Clerkenwell, 1800-20.
- **Adam**, Clerkenwell and Woolwich; inventor of an adjustment for Graham's pendulum; 1779-1835. Henderson, in his "Life of Ferguson," speaks of **Andrew Reid**, a clever watchmaker, who died at Brixton in 1835, aged 85.
- **Thomas**, born 1750, died 1834; a celebrated Edinburgh clockmaker (partner with Auld); author of "Treatise on Clock and Watchmaking," published in 1826; hon. freeman C.C. 1825.
- Reilly, J. C.**, 12, Middle Row, Holborn, 1815-25.
- Reinhold**. (See Roll.)
- Reith, James**, admitted C.C. 1705.
- Relph, E.**, 182, Tooley St., 1835.
- Renner, Michael E.**, Kronstat; table clock, about 1590.
- Renshaw, Thomas**, Ship Alley, Wellclose Sq., 1825.
- Rentnow**. (See Wontner.)
- Rentzsch, Sigismund**, 2, George St., St. James's Sq. He patented in 1813 an automatic timekeeper somewhat similar to Horstmann's (see p. 265), 1813-42.
- Restell, Thos.**, Tooting. In 1848 he patented (No. 12154), escapement; Strand in 1852, when he patented another escapement (No. 324).
- Rettord, Jno.**, London; watch, 1798.
- Rewalling, Thomas**, C.C. 1715.
- Rex, Thomas**, 96, Broad St., Ratcliff, 1842.
- Reyner, Stephen**, at ye Dial, Bishops-gate Within, admitted C.C. 1691.
- **Thos.**, Oxon.; bracket clock, about 1740.
- Reynolds, Joseph**, admitted C.C. 1691.
- **Thomas**, admitted C.C. 1705; small bracket chiming clock, two trains only, arch dial, with strike silent hand, inscribed "Thomas Reynolds, St. Martin's-le-Grand," about 1740.
- **Thos.**, Warwick; a watch by him, silver cock, silver name plate, steel index disc, about 1730.
- Reynolds, Jno.**, blacksmith, Hagbourn, Berks.; made a clock and chimes for Brampton Church, for which he was paid £34; 1732.
- **Francis**, Kensington, about 1776.
- **Thos. and Son**, 1, Sparrow Corner, Minories, 1783-94.
- **Thos.** (materials), 2, St. Martin's-le-Grand, 1785-1810; a verge watch by him in the Guildhall Museum, tortoiseshell case.
- **G.**, 10, Gough Sq., 1830.
- **T.**, 25, Coppice Row, Clerkenwell, 1835.
- Rice, Stephen**, 20, Pall Mall, 1793.
- Rich, Jno.**, London; repeating watch, 1775.
- Richard, Daniel John**; said to have introduced watchmaking into Switzerland in 1665.
- **Peter**, admitted C.C. 1679.
- Richards, Luke**, admitted C.C. 1648.
- **Henry**, London C.C. 1699; watch, 1725.
- **Hugh**, master C.C. 1735.
- **Thomas**, 114, Strand, 1770-72.
- **William**, Albemarle St., Clerkenwell; liveryman C.C. 1776.
- **Jno.**, London; several watches, 1780-96.
- **William**, 43, Brick Lane, Old St., 1794; Richards, S. and J., 1817.
- **Thomas**, 17, Bridgewater Sq., Barbican, 1804; 96, Shoreditch, 1830.
- **W.**, 49, Oxford St., 1830.
- Richardson, Richard**, C.C. 1675; "a good wheel cutter" (Hatton).
- **James**, master C.C. 1788.
- **John**, Racquet Court, 1798-1811; liveryman C.C. 1810.
- Richmond, Robt.**, Lancaster, 1817.
- Rickman, W.**, 35, Great Pulteney St., 1820.
- Ricord, Richard**, admitted C.C. 1649.
- Riddlesdon, Samuel**, C.C. 1766.
- **Jno.**; watch-spring maker, Red Cross Sq., 1790-94.
- Rider, John**, Camberwell Green, 1835.
- Ridgdale, N.**; oval watch, S.K.M., about 1610.
- Ridley, Josiah**, admitted C.C. 1685.
- **Joseph**, received a reward of 20 guineas from the Society of Arts, for a sector and depthing tool, 1788.
- **Thos.**, 14, Waterloo Rd., and Enfield, 1830-42.
- Riesle, E.**; wooden and musical clock-maker, 2, Garden Row, London Rd., 1840.

- Rigaud**, —, London; watch by him about 1740; belonging to Mr. Geo. Carr Glyn.
- Rigby, Joshua**, 5, Berkeley St., Clerkenwell, hon. freeman C.C. 1781; spoken of by Hatton and by Earnshaw; maker of a repeater watch for the Duke of Sussex; 1765-1800.
- **E., and Son**, 6, Berkeley St., Clerkenwell, 1795-1800.
- **James**, 35, Rosoman St., Clerkenwell, 1804.
- **Thos.**, 29, Alfred Place, Goswell Rd., 1816-18.
- **Joshua**, 8, King St., Goswell Rd., 1820.
- **J.**, watch - movement maker, Nelson Terrace, City Rd., 1820.
- **James**, 8, Charing Cross, 1806-30 (succeeded Leroux, see Morse, Richd.).
- Rimbault, Stephen**, 7, Great St. Andrew St., 1760-81 (see p. 332).
- **Paul**, 9, Denmark St., St. Giles's, 1779-85.
- Ring, Joseph**, admitted C.C. 1693.
- Rippin, William**, Holbeach, Lincolnshire; worked at his trade as watch and clock repairer for thirty years after he lost his sight, vouched for by his daughter and many other persons; he died in 1857.
- Rippon, Richard**, 46, King St., Seven Dials, 1816; afterwards of Cook's Court, Long Acre; a well-known maker of English repeating work for watches. E. J. Dent married his widow.
- Risbridger, William**, Dorking; maker of lantern and thirty-hour long-case clocks, about 1700.
- Ritchie, David**, Clerkenwell; devised a compensation pendulum in 1812.
- Ritherdon, Geo.**, Aldgate, 1753-83.
- **Robert**, 3, Aldgate Within, 1758-1800.
- Rivers, David**, 3, Sweeting's Alley; livery C.C. 1766; master, 1773; 1760-83.
- **David**, 3, Bridgewater Sq., 1753-75.
- **Jno.**, 1, Holborn Bars, 1783.
- **and Son**, 38, Cornhill, 1790-1812; Wm. Rivers, master C.C. 1794.
- **William**, 33, Cornhill, 1818-20
- Riviere, Samuel Newton**, 63, New Bond St., 1790-1804.
- Roberts, B.**, London; watch, 1783.
- Robbin, Fabian**, London, maker of a walnut marqueterie long-case month clock, square dial, bull's-eye in front of pendulum bob, 1690-1700.
- Robbins, J.**, 24, Percival St., 1842.
- Robert, Henri**, Paris, chronometer maker, 1830-65.
- Roberts, H.**, admitted C.C. 1664; in the B.M. is a large astronomical watch by him.
- **Gideon**, Bristol, Conn., U.S.A., maker of American clocks, 1790.
- **S.**, London; watch, 1790.
- **Josiah**, 88, Bishopsgate St., 1793.
- **Jno.**, St. James's Market, 1790.
- **Wm.**, St. James's Market, 1806; 5, St. Alban's Place, Pall Mall, 1820-30.
- **C.**, London; watch, 1820.
- **George**, 27, Marchmont St., Brunswick Sq., 1820.
- **Jas.**, 87, Union St., Boro', 1842.
- Robertson, Benj.**, 14, Jewin St., 1783.
- Robin, R.**, Paris; born 1742, died 1799; clockmaker to Louis XV., two excellent examples of his work are in the Jones collection at S.K.M. (see also p. 276).
- Robins, John**, 67, Aldersgate St., 1783-94.
- **Wm.**, 13, Fleet St., 1783; master C.C. 1813.
- **John**, 13, Clerkenwell Green, 1800-4; 65, Charing Cross, 1817.
- **John**, 13, Frith St., 1823-30.
- Robinson, Robert**, C.C. 1652.
- **William**, admitted C.C. 1667.
- **Thomas**, admitted C.C. 1703.
- **Francis**, "in the Temple"; apprenticed to Thomas Williamson, 1672; master C.C. 1725; repeating watch by him with silver case in the Guildhall Museum, inscribed, "Servant to his Royal Highness;" another example, a small square case clock, square dial with cherub corners, 1679-1726.
- **Ruhamer**, admitted C.C. 1713.
- **William**, apprenticed to Daniel Delander; admitted C.C. 1720.
- **Philip**, Fleet St., 1737-40.
- **James**, at the Dial in Grace's Alley, Well Close Sq.; maker of long-case clocks and watches, 1730-70.
- **Jno.**, Lancaster, 1783.
- **M.**; repeating watch, gold *repoussé* case, Schloss collection, 1780.
- **and Cave**, "232, Strand, near Temple Barr," card Ponsouby collection, about 1770.
- **Anthony**, 232, Strand, 1783.
- **Richard**, watch-chain maker, 4, Goldsmith Row, 1790.
- **Matthew**, watch - movement maker, 8, Charterhouse St., 1790-94.
- **Owen**, an escapement maker who worked for Arnold, mentioned by

- Reid as the maker of a double chronometer escapement, 1780-1810.
- Robinson, Thos.**, London; watch, 1830.
- **Richard**, watch-movement maker, 27, Ray St., Clerkenwell, 1835.
- Robotham, Fras.**, High St., Hampstead, 1836-40.
- Robson, Wm.**, Curtain Rd., 1780-94.
- **William**, musical clockmaker, 48, Redcross St., 1797-1810; master C.C. 1809.
- Roby, James**, 2, Prince's St., Leicester Sq., 1793-1800.
- Rochat, Jules**, 82, Dean St., Soho, 1840-42.
- Rochford, M. F.**, 212, Piccadilly, 1804-25; F., 29, Jermyn St., 1830.
- Rodanet, J. H.**, Paris; chronometer maker; died 1884, aged 74.
- Rodgers, J.**, 39, St. Paul's Churchyard; rack-lever watch, 1818.
- Roger**, —, repaired the clock at Exeter Cathedral, 1424 (see p. 33).
- Rogers, William**, admitted C.C. 1641. Nicasius Russell was apprenticed to him in 1653.
- **John**, admitted C.C. 1731.
- **William**, Broad St. Buildings, liveryman C.C. 1776.
- Fenchurch St., 1774.
- **Isaac**, White Hart Court, Gracechurch St., a maker of good watches; a specimen in gold *repoussé* outer case is in the B.M.; did a good trade in foreign markets. Example of his work: bracket clock with painted case, Persian flower pattern, brass arched dial, Turkish figures; engraved back plate and formerly crown escapement; tunes at the hour; had dancing figures, a ship or other mechanism, showing through dial, the pulleys for this alone remain. Bought in the Bazaar, Constantinople, 1881; 1750-94.
- **Isaac**, 4, White Hart Court, Gracechurch St.; admitted C.C. 1776; master, 1824; succeeded to his father's business, 1776; removed to 24, Little Bell Alley, Coleman St., in 1802; died 1839.
- Thomas**, 63, Charing Cross, liveryman C.C. 1810; Wm. Rogers, same address, 1817.
- **C.**, 59, Charlton St., Somers Town, 1820.
- **John**, 22, Wilmington Sq.; made watches for the American market; born 1817, died 1868.
- Rogerson, William**, Exchange, livery C.C. 1766; master, 1774; 1760-75.
- **Henry**, London, about 1800.
- Roget**, —, London; watch about 1740; another 1755.
- Rolf, Joseph, and Son**, 17, Foster Lane, 1769-88.
- Rolfe, Robert**, 29, St. John's Sq., Clerkenwell, 1835; succeeded Gravell and Son in 1850.
- Roll, George**, Augsburg. In 1588 he made a clockwork globe, which Rudolph II. bought for 1000 florins. At the S.K.M. is a striking clock in a celestial sphere of gilt brass on four feet; the sphere is inscribed "Elaborabat Georgivs Roll et Johannes Reinhold in Avgvsta Anno Domini 1584."
- Roman**. (See Roux.)
- Rombach, J.**, 103, Regent St., 1835.
- Rome, Wm.**, 6, Shepperton Place, North Rd., 1842.
- Romer, Flack**, admitted C.C. 1661.
- **Thos.**, 20, George St., Adelphi, 1817.
- Romeux, Lewis de**, C.C. 1706.
- Romieu** à Rouen, on a watch, centre of dial enamelled emerald green, hours on white ring of enamel, about 1650.
- **Paul**, Edinburgh, probably from Rouen; submitted his essay, made in his own chamber and vouched for by George Mill and Andrew Brown, and was admitted to the incorporation of Hammermen 1677; died 1693; watch, Hawkins collection, about 1680.
- **Paul**, Edinburgh, son of the foregoing, admitted 1682, his essay masters being Richard Mill and Jno. Symson; died 1710.
- "Stolen this day in the Parliament House, out of a gentleman's pocket, a silver pendulum watch with a minute hand and a green shagreen case, some of the studs broken off. Whoever can give notice of the said watch to Mr. Romieu, watchmaker, shall be thankfully rewarded" (*Edinburgh Gaz.*, 1699).
- Romilly**, —, Paris; watch, about 1760.
- **Peter**, 17, Frith St., Soho, 1769-94; long-case chiming clock, inscribed "Romilly, London," about 1770.
- Romley, Chris.**, and **Romley, Rob.**, both quoted by Ludlam, 1760.
- Romney, Joseph**, admitted C.C. 1664.
- Ronnizen, Adam**, admitted C.C. 1687.
- Roof, Daniel**, C.C. 1676.
- Rooke, John**, 26, Berkeley Sq., 1765-94; hon. freeman C.C. 1781.
- Rooker, Richard**, Chelsea, admitted

- U.C. 1728; maker of a large silver watch, silver chased dial, behind an aperture in which a pendulum swings, 1728-40.
- Rookes, Barlow**, admitted C.C. 1667.
- Rooksby, —**. A small timepiece with repeating work, dial brass gilt, beautifully engraved, inscribed "J. Rooksby in Yorke," about 1690.
- "Stolen on the 23rd instant, out of Mr. Jeffreys' House in York, a gold pendulum watch with minutes and seconds, made by Mr. Rooksby, of Hull, with a gold studded case. Notice to be given to Mr. Hill, Goldsmith, in the Strand" (*Lond. Gaz.*, Nov. 26-30, 1691).
- Rose, Michael**, admitted C.C. 1676.
- **Joseph, and Son**, 19, Foster Lane, 1765-68.
- , —, **jun.**, St. Ann's Lane, 1774.
- **Joseph, Son, and Payne**, 17, Foster Lane, 1771-94.
- **John**, 96, Fleet Market, 1830.
- Roskell, Robert**, the elder, Liverpool, introduced the rack lever patented by Litherland, and was a collector of curious horological specimens, 1805-30.
- Ross, Wm.**, Cork; watch, handsome *repoussé* case, h.m. 1793.
- **and Peckham**, 41, Bedford St., Covent Garden, 1810.
- Rosse, Samuel**, admitted C.C. 1679.
- Rossi, W.**, 5, Blackman St., 1830.
- Rotheram, Thomas**, C.C. 1662.
- **R. H.**, Coventry; died 1864, aged 74. (See also Vale.)
- Rotherodd, Benjamin**, maker of a silver rose-shaped watch which was in the Bernal Collection seventeenth century work.
- Rothwood, Robert**, C.C. 1632.
- **Robert**, admitted C.C. 1648.
- Rouckleiffe, Jno.**, Bridgewater; maker of brass clocks, 1770. (See Brimble.)
- Roumieu, Adam**, C.C. 1695.
- **John**, admitted C.C. 1720.
- **Adam**, admitted C.C. 1726.
- Roumyen, James**, admitted C.C. 1692.
- Rousseau, Jean**, a clever watchmaker; a crystal-cased watch in the form of a cross by him in the Fellows collection, about 1590.
- **Jean**, son of the above, born 1609, died 1684; maker of a silver watch in the S.K.M., engraved with figures of the seasons and with flowers.
- Routh, Sam.**, London; clock, about 1780.
- Routledge, Geo.**, Lydford, Devon, died 1801; curious epitaph in Lydford churchyard as follows:
- Here lies in a horizontal position the outside case of
- GEORGE ROUTLEDGE, Watchmaker.
- Integrity was the mainspring and prudence the regulator of all the actions of his life; humane, generous and liberal,
- His hand never stopped till he had relieved distress.
- So nicely regulated were his movements that he never went wrong, except when set going by people who did not know his key.
- Even then he was easily set right again.
- He had the art of disposing of his time so well, that his hours glided away, his pulse stopped beating.
- He ran down November 14, 1801, aged 57, in hopes of being taken in hand by his Maker, Thoroughly cleaned, repaired, wound up, and set going in the world to come, when time shall be no more.
- Roux, Bordier and Roman**, Geneva, about 1810.
- Rowden, John**, London; watch, silver dial, with raised figures, square pillars, no jewel, about 1700.
- Rowe, Thomas**, admitted C.C. 1699.
- **Benjamin**, admitted C.C. 1708.
- **John**, St. Paul's Churchyard, liveryman C.C. 1770-80.
- Rowland and Co.**, 8 Coventry St., 1825.
- Rowlands, William, and Son**, 92, Quadrant, 1823.
- **William**, Smith St., Clerkenwell, watch-case maker, apprenticed to T. and R. Carpenter; treasurer and a liberal supporter of the Clock and Watchmakers' Asylum; livery C.C. 1820, master 1860; died 1868, aged 77.
- **Cristopher**, 132, Long Acre, 1815; 9, Coventry St., 1835; 33, Leadenhall St., 1840.
- **R.**, watch-case maker, 35, Merc-dith St., Clerkenwell, 1835.
- Rowley, —**, made an orrery, 1716.
- Rowning, —**, "Once a bad clockmaker in Cambridge" (Ludlam, 1758).
- Roy, David**, admitted C.C. 1682.
- **William**, 30, Bell Yard, Lincoln's Inn, 1804.
- Roycroft, Thomas**, admitted as a free-man C.C. 1699.
- Royer, William**, 40, Gee St., Goswell Rd., 1820.
- Roylands, William**, watch movement maker, 29, Chiswell St., 1790-94.
- Roze, A. C.**, died 1862.
- Rudkin, Thomas**, C.C. 1683.
- Rudrupp, Jno.**, Amersham; maker of lantern clocks, about 1710.
- Ruegger, —**, Geneva, 1800.
- Ruel, Samuel**, Rotterdam; calendar watch, Schloss collection; nicely pierced work on movement, "the triumph of Venus," h.m. 1788 (p. 151).

- Rugend**, —, Auch; tulip watch, Soltykoff collection, about 1570 (see p. 107).
- Rugendas, Nicholas**, Augsburg, 1605–30 (see p. 99).
- Rugg and Thaine**, 15, Cheapside; enamelled watch by them, Dunn Gardner collection, S.K.M., 1769–94.
- Rugless, Sam.**, 37, Ratcliff Highway, 1815–25.
- **T.**, 3, Cannon St., St. George's East, 1842.
- Rundell, Edwd.**, Norton St. Phillip's; maker of a fine musical clock, about 1710.
- **and Bridge**, 32, Ludgate Hill, 1788–1824; watch, marked Rundell, Bridge, and Rundell, 1830. Rundell and Bridge succeeded Pickett and Rundell; they were silversmiths to the Crown, and their shop one of the attractions of London. The business was purchased by Francis Lambert, and transferred to Coventry St.
- Rush, Samuel**, 16, Ludgate Hill, and Porter St., Leicester Fields, 1759–90.
- Russel, Thomas**, watch-case maker, 18, Barbican, 1775.
- **Charles**, 18, Barbican, 1790.
- Russell, Nicholas**, apprenticed to William Rogers in 1653; master C.C. 1692; died 1700.
- “A plain hour watch goes but 24 hours, the name on it is Niculus Russell, Londini, fecit” (*Lond. Gaz.*, Dec. 22–27, 1697).
- **Thomas**, Barbican; liveryman C.C. 1776.
- **Thos.**, Lancaster, 1797–1832.
- **A. C.**, London; watch, Schloss collection, about 1800.
- **Charles and Thomas**, 18, Barbican, 1787–1815.
- **T.**, 50, Great Sutton St., 1842.
- Rutland, Jonathan**, 110, Oxford St., 1793–1804.
- **James**, 83, Oxford St., 1822–30.
- Rutter, Jno.**, St. James's Walk, 1793.
- Ruttiven, William**, maker of a lantern clock, 1630.
- Rycroft, Thos.**; a watch by him is mentioned in the *Lond. Gaz.*, Sept. 21–25, 1693.
- Ryder, Thomas**, admitted C.C. 1698.
- **Thomas**, admitted C.C. 1712.
- **Josh.**, London; watch, h.m. 1761.
- Ryland, Jno.**, London; watch, 1780.
- Ryler, William**, admitted C.C. 1712.
- Ryley, Thomas**, admitted C.C. 1704.
- Rymer, Hy.**, 6, George St., Adelphi, 1817.
- Saber, Edwd.**, Cannon St., 1783.
- Saberty, J.**, London; watch, 1765.
- Sacheverell, Benassir**, apprenticed to Tompion; admitted C.C. 1687.
- Sadleir, Samuel**, warden C.C. 1723; 1720–23.
- Sadler, Stephen**, 134, Bishopsgate Without, 1830.
- Saer, Joseph**, admitted C.C. 1687; maker of a square-dial brass eight-day clock, two hands, inscription “Joseph Saer, in Penpool Lane, London,” 1686–1700.
- Saffory, John**, 13, Tokenhouse Yard, 1760–75.
- Sagar**, —, Middleham, 1750.
- Sainsbury, J.** (tools), 2, Cowcross St., 1806–23.
- **Richard**, 9, Wingrove Place, Clerkenwell, 1840–42.
- St. Andrew, G.**, London; watch, 1790.
- St. Leu.** (See De St. Leu.)
- Salisbury, Wm.**, London; watch, 1730.
- Salmon, Henry**, Coventry St., Piccadilly, 1769–82.
- **Robert**, 49, Strand, 1790–94.
- **C. E.**, 151, Bishopsgate Without, 1823.
- Salter, Edward**, 20, Cannon St., 1788–94.
- **John**, 35, Strand, 1804; 73, Strand, 1825–30.
- Saltmarsh, Samuel**, 74, Middleton St., Clerkenwell, 1840.
- Sambrook, John**, C.C. 1680.
- Samley**, —, Gutter Lane, 1775.
- Samon, John**, admitted C.C. 1654.
- Sampson, Robert**, Westminster; invented a two-part chime clock, described in “Transactions of the Society of Arts,” vol. iv., 1786; card, B.M., “Robert Sampson, 2, Petty Terrace, Westminster, 1788.”
- **Wm.**, London, about 1800.
- Samson**, London, on many watches, Dutch style, 1760–96.
- **Samuel**, Westminster; watch, B.M., about 1780; also a silver *repoussé* pair-case watch, apparently for the Dutch market. h.m. 1800; also a musical and mechanical bracket clock, 1778–1805.
- **J.**, 11, Denmark St., Soho; maker of a verge watch with engraving of the Crucifixion in white metal fastened above the balance wheel, and a semi-circular piece of metal fastened below it, and decorated with doublet rubies, emeralds, and topazes, 1800–5.
- **and Grandin**, Denmark St., Soho, 1810.
- Samuel, Humphrey**, Panton St., Haymarket, 1790.
- **and Hill**, 3, Charing Cross, 1793.

- Samuel, Abraham**, 11, Little Alie St., Goodman's Fields, 1820-25.
- **J.**, 142, High St., Shadwell, 1835.
- **Abraham, and Son**, 11, Little Alie St., Goodman's Fields, 1840-42.
- Sande, Thos.**; watch, B.M., 1620.
- Sanders, Daniel**, admitted C.C. 1632.
- **George**, 57, Sion Gardens, Aldermanbury, 1790-94.
- **Jas.**, 46, St. John St., 1790-94.
- **John**, 3, Holborn Hill, 1810-15.
- **George**, 8, Gee St., Goswell Rd., 1820.
- Sanderson, Robert**, Strand, admitted C.C. 1703; afterwards Sanderson and Son. Hatton in 1773 speaks of the late Mr. Sanderson as an improver of calendar work, and the son as clever, 1703-50.
- **Jno.**, Wigton, 1715.
- **George**, Exeter; patentee of tools for duplicating parts of watches (1761, No. 763); also a lunar and calendar watch-key (1762, No. 777).
- **Hy.**, 301, Strand, 1778-81.
- **Thos.**, 105, Bishopsgate Within, 1815.
- **Samuel**, 63, Mark Lane, 1840.
- Sandford, William**, 15, Conduit St., 1800-25.
- Sandoz, J. G.**, Paris; born 1836, died 1891.
- Sands, Jno.**, St. Dunstan's Alley, 1790.
- Sandys, Jas.**, 137, St. John St., 1800.
- Saplin, P.**, 42, Whitcomb St., Haymarket, 1835-42.
- **T.**, 17, East Rd., Hoxton, 1842.
- Sarbitt, John**, 11, St. Martin's Court, 1804.
- Sargeant, B.**, 40, Garden Row, London Rd., 1835.
- **H.**, 10, Wells St., Oxford St., 1835.
- Sargent, Robert**, admitted C.C. 1720.
- **Benjamin**, 133, Fleet St., 1769-88.
- **Josh.**, 106, Jermyn St., 1794-1818.
- Sarjeant, Nathaniel**. (See Sergeant).
- Sarl, J.**, 18, Cornhill, 1842.
- Satchabell, Thomas**, 9, Bridgewater Sq., 1804.
- Sather, Thos.**, London; bracket clock, 1730.
- Sattell, C.**, watch-case maker, 36, Clerkenwell Green, 1795-1800.
- Saunders, John**, admitted C.C. 1721.
- **John**, admitted C.C. 1730.
- **Joshua**, Cripplegate Buildings, 1765-70.
- **Thos.**, 258, Whitechapel, 1817.
- **D.**, Parkside, Knightsbridge, 1820-40.
- Saunier, Claudius**, born at Macon, France, 1816. Author of "Traite d'Horlogerie Moderne, Paris, 1870"; founded in 1859 *Revue Chronometrique*, which he edited till his death in 1896.
- Savage, Thomas**, London; 1677.
- "Stolen out of the house of John Shorren, Esq., Norfolk Street, a gold watch made by Thomas Savage, of London" (*Lond. Gaz.*, Sept. 10-14, 1691).
- **and Vincent**, 60, Red Lion St., 1800-15. Thos. Savage, livery C.C. 1804.
- **Thos.**, 3, Red Lion St., 1816-40.
- **W.**, 8, Chapel St., Bedford Row, 1820-25.
- **Samuel**, 8, Red Lion St., Clerkenwell, 1825.
- **D.**, 7, Queen St., Northampton Sq., 1835.
- **Thomas**, 21, Sidney St., Goswell Rd., 1842.
- **George**, a watchmaker who, in the early part of this century, did much to perfect the lever escapement, besides inventing the two-pin variety. He lived at Huddersfield, where in 1808 he patented a remontoire; afterwards at Clerkenwell, but in his old days emigrated to Canada, and founded a flourishing retail business in Montreal, where he died.
- Saville, John**, admitted C.C. 1656; assistant, 1675; died 1679; maker of a watch reputed to have belonged to William of Orange, dated 1656, silver box, outer case of tortoiseshell decorated with silver; 1656-79.
- **John**, admitted C.C. 1678. There was a brass lantern clock of his production at Blackburn in 1887; 1678-85.
- Savory, Andrew**, admitted C.C. 1676; known as a maker of lantern and bracket clocks, 1676-1700.
- **Joseph**, 48, Cheapside, 1788.
- **Farrand and Co.**, 48, Cheapside, 1793-1800.
- **Joseph and Co.**, 1820.
- **A.**, 54, Cheapside, 1825.
- **Thos. Cox**, 47, Cornhill, 1834-64.
- **Adey B., and Son**, 11 and 12, Cornhill, 1865; afterwards "Goldsmiths' Alliance." Joseph and H. R. Savory, managing directors. Closed in 1893.
- Sawyer, Paul**, admitted C.C. 1718.
- **John**, 1, Poultry, 1804.
- Say, Nehemiah**, admitted C.C. 1654.
- Sayller, Jno.**; oval watch by him Vienna Treasury, about 1650.

- Safe, William**, "at ye sign of the clock in King Street, near Guild Hall"; admitted C.C. by redemption, 1720; master in 1749.
- Scale, Henry**. Of him was bought Huggerford's watch with false jewelling used as evidence against Facio (see p. 351); 1705.
- **G.**, musical clockmaker, 15, Wellington St., Goswell St., 1840.
- Scales, Edwd.**, 33, Strand, 1775-80.
- Scantlebury, W.**, 17, Golden Lane, 1780-92.
- Scherer, George F.**, 227, Regent St., 1835-40.
- Scheirer, Johan**; hexagonal clock, about 1620, Schloss collection (see p. 83).
- Schlotsky, Joseph**, 90, Houndsditch, 1840-45.
- Schlott, Hanns**. In the B.M. is a clock in the form of a ship by him, said to have been made for the Emperor Rudolph II.; 1578-81.
- Schmidt, J.**, Hamburg; table clock, about 1710.
- **John**, St. Mary Axe; patentee of mysterious clock (1808, No. 3185) (see p. 294), 1800-10.
- Schofield, Jno.**, 29, Bell Yard, 1793.
- **W.**, 35, Cheyne Walk, Chelsea; maker of long-case clocks, 1815-25.
- **William**, 2, Clerkenwell Close, 1830-35.
- Scholefield, James**, London, maker of long-case clocks, about 1800.
- Schretger**, à Augsburg, 1660.
- Schuler, M. and J.**, 16, Commercial Place, London Rd., 1835-42.
- Schultz**, —, Augsburg; Latin Cross watch, Schloss collection, about 1570.
- Schutt, Jasper**, admitted C.C. 1648.
- Schwilgue, Jean B.**, born 1776, died 1856; restored Strasburg clock, 1838 (see p. 40).
- Science, John**, admitted C.C. 1724.
- Scolding, John**, 7, Great Prescott St., 1794-1810.
- Scotchford, Thomas Charles**, London, a good maker of lever pallets, 1830-76.
- Scott, Daniel**, admitted C.C. 1697.
- , —, Gracechurch St., 1770-75.
- **James**, apprenticed to John Jackson, 1752; admitted C.C. 1766.
- **John**, 40, Gloucester St., Red Lion Sq., hon. freeman C.C. 1781; 1770-94.
- **Wm.**, 39, Dartmouth St., 1790-94.
- **and Thorpe**, Strand; watch, 1780.
- **Thos.**, 65, Charing Cross, 1810-20.
- **A., and Co.**, 64, West Smithfield, 1828-32.
- Scott, Wm.**, 40, Skinner St., Clerkenwell, 1830-42.
- **Jesse**, 45, King Sq., 1835-42.
- **Robert**, 20, Bell Yard, Temple Bar, 1815-40.
- **Wing and Co.**, 59 and 60, Red Lion St., Holborn, 1840-42.
- Sea, Frederick**, 18, Bartholomew Close, 1820-30.
- Seaborne, James**, C.C. 1648-50.
- Seagrave, Matthew**, C.C. 1730.
- **Robert**, 35, Gutter Lane, 1790.
- Seaman**, London; watch, Dutch style, about 1765.
- Seamore, W.**, Minorities; watch about 1750, Mr. Geo. Carr Glyn.
- Searle, George**, 15, Wellington St., 1830-40.
- Seatoun, G.**, 29, Gutter Lane, Cheap-side, card Ponsonby collection, about 1795.
- Seddon, James**, in St. James's, admitted C.C. 1662.
- **Nathaniel**, in St. James's, admitted C.C. 1691; watch, Schloss collection.
- **Humphrey**, Southwark, about 1730.
- Sedley, Thos.**, London; watch, 1710.
- Sedwell, Edward**, C.C. 1664.
- Seignior, Robert**, an eminent maker in his day; received, in 1682, £20 for a clock set up in the Treasury Chambers, 1670-82. "A silver Pendulum watch, with a Tortoise-shell case inlaid with silver, made by Mr. Seignior, Exchange Alley" (*Lond. Gaz.*, Dec. 16-19, 1695). (See also Senior.)
- Sellers, John**, warden C.C. 1692; excused from serving as master in 1696, on account of ill-health; 1685-96.
- Sellers, William**, Long Acre, 1740.
- Selwood, William**, ye Mermaid, in Lothbury; admitted C.C. 1633; an early maker of lantern clocks, 1620-36.
- **John**, admitted C.C. 1641.
- Seney, G.**, "orloger du Roy, à Rouen," crystal case watch in the form of a fleur de lys, S.K.M., about 1640.
- Senior** (Seignior?), a watch by him mentioned *Lond. Gaz.*, Aug., 1690.
- Sens, William**, admitted C.C. 1711.
- Sergeant, Nathaniel**, 224, Wapping, master C.C. 1783; 1769-84.
- **Benjamin**, 133, Fleet St., 1754-68.
- Sermard, F.**; Tulip watch, Nelthropp collection, about 1650.
- Servant, H.**, 68, Salisbury Court, 1775.
- Servier**. (See Grollier.)

- Seur, Chas.**, London; small timepiece with pendulum swinging in front of the dial, about 1695.
- Sewell, Geo.**, 47, Blackman St., 1790-94.
- Sexty, R.**, 71, Carlisle St., Lambeth, 1830-40.
- Seydell, Ferd.**, London; repeating watch, 1775.
- Seyffert, Frederick, W.**, St. John St., Clerkenwell, patented in 1818 (No. 8317), a repeating motion.
- Seymore, John**, admitted C.C. 1710.
- Seymour, Jno.**, Wantage; long-case clock, 1712.
- **William**, Minories; maker of a mahogany-case bracket clock, handle on top, brass dial, style 1750; also a watch, h.m. 1780.
- Shalcross, Josiah**, maker of cylinder escapements with ruby cylinders, and of duplex escapements; for many years in the employ of McCabes; born 1800, died 1866.
- Sharp and Williams**, 6, Strand, 1790.
- **J.**, 20, Little Tower St., 1794-1808.
- **John**, 30, Fish St. Hill, 1806-25.
- **and Son**, 30, Fish St. Hill (John Sharp, master C.C. 1833 and 1835); 1826-40; watch, h.m. 1823, "Sharp and Son, London Bridge."
- **T.**, 9, Postern Row, Tower Hill, 1816; George Sharp, 1822-25.
- Sharpe, William**, admitted C.C. 1681.
- **Wm.**, 75, Holborn Bridge, 1793.
- Sharpnell, James**, 60, Charing Cross, 1775.
- Shaw, John**, "near the Bars in Holborn," admitted C.C. 1682; master in 1712; maker of a splendid marqueterie-case clock; 1682-1714. Lancaster; Thos., 1726; Robt., 1789.
- **Anna Maria**, apprenticed for seven years to Isaac Loddington and his wife, 1733.
- **William**, 22, Wood St., Cheapside, 1760-72.
- Shayler, Richard**, Ball Alley, Lombard St., 1753-56.
- **William**, 44, Lombard St., 1755-75.
- Sheafe, William**, 16, Bell Alley, Coleman St., 1770-94; watch by him with E. Mason, Greenwich, on dial.
- Shearer, James**, 23, Devonshire St., Queen Sq. The Duke of Sussex had a skeleton-movement astronomical clock by him; 1825-42.
- Shearwood, Jas.**, London; watch, 1767.
- Shedel, Jos.**, London; small bracket clock, about 1750.
- Sheldrick, Edward**, 48, Cheapside, 1798-1803.
- Shelley, Jno.**; lantern clock, 1636.
- Shelly, Joseph**, admitted C.C. 1717.
- **and King**, 149, Shoreditch, 1772-75.
- **Samuel**, 61, St. Paul's Churchyard, 1775.
- Shelton, Samson**, member of the Blacksmiths' Company; active in obtaining the charter of the C.C., of which he was one of the first wardens in 1631; died 1649, leaving £50 to the C.C.; fine clock-watch by him B.M.; 1623-49.
- **John**, Shoe Lane, C.C. 1720; livery, 1766. In a letter to the Royal Society from Jas. Short in 1752, Jno. Shelton is referred to as "the principal person employed by Mr. Graham in making astronomical clocks." He published a description of the dead-beat escapement in the *Gentleman's Magazine* for September, 1754. Nevil Maskelyne in 1761 tested a clock of his make.
- Shepherd, Thos.**, London; C.C. 1632; maker of an oval watch, about 1620.
- Shepherd, Henry**, 4, Pope's Head Alley, Cornhill, 1760-75.
- **Wm.**, 199, Strand, 1815-25.
- Sheppard, Samuel**, 1, Hanover St., Hanover Sq., 1830.
- Shepperd, Thomas**. (See Shepheard.)
- **Sarah**, 199, Strand, 1830.
- **Charles**, 7, Chadwell St., 1840-42.
- Sheraton, Thomas** (see p. 325), 1803.
- Sherbird, J.**, Turk's St., Bethnal Green, 1820.
- Sherborne, Thomas**, 6, Strand, 1793-1800.
- Shere, Henry, and Arnold**, 46, Lombard St., 1753-68.
- Sherwood, William**, apprenticed to James Delander; admitted C.C. 1695; 1695-1721.
- **William**, admitted C.C. 1720; master in 1740.
- Shick, William**, 43, Brick Lane, Old St., 1820.
- Shields, John**, 19, Bridge St., Lambeth, 1835.
- **John**, 33, Great Marylebone St., 1840-42.
- Shindler, Thomas**, Canterbury; maker of long-case clocks, about 1720.
- Shirley, John**, admitted C.C. 1720; in 1724 paid £20 to be transferred to the Vintners' Company.
- Shirt, Wm.**, 25, Coleman St., Bunhill Row, and 10, City Road, 1815-35.
- Shole, Sim.**, Deptford, 1825.
- Short, Joshua**, admitted C.C. 1665.

- Short, James**, Surrey St., Strand, 1740-70; a maker of repute who sent to the Royal Society in 1752 an interesting letter on compensated pendulums. Harrison's son, before starting on his voyage to Barbadoes, in 1764, set his chronometer by Short's regulator.
- Shorter, E.**, 4, Bridge Rd., Southwark, 1830.
- Shrapnell, James**, 36, Ludgate St., 1761-70; 60, Charing Cross, 1788-94.
- Shuckburg, Charles**, C.C. 1719.
- Shuttleworth, Henry**, C.C. 1669.
- **Francis**, 23, Duke St., Piccadilly, 1806-10.
- Sibbald, William**, 4, Cannon St. Rd., 1815-35.
- Sidey, Benjamin**, 5, Moorfields, admitted C.C. 1730; master, 1761 and 1789; known as a good watchmaker, and active in matters affecting the interests of the trade, 1730-90.
- —, **jnr.**, London; watch, 1798.
- Sidley, John**, admitted C.C. 1701.
- **Benjamin**, admitted C.C. 1710.
- Silke, Jno.**, Elmsted; lantern clock, Mr. F. A. Field, about 1670.
- Sills, William**, a marine chronometer finisher of surpassing merit; born 1812, died 1884; he worked for Robert and Henry Molyneux and other eminent makers.
- Silver, Jon.**, London; watch, 1645.
- **Fredk.**, livery, C.C. 1810.
- **Joseph**, 28, Hatton Garden, 1793.
- **J. and J.**, 28, Hatton Garden, 1825-30.
- Simcox, William**, admitted C.C. 1682.
- **Samuel**, admitted C.C. 1708.
- Simkin, Ben.**, 16, High St., Boro', 1788-93.
- Simmons, John**, Fleet St., 1753-56.
- **Ebenezer**, 1, Pavement, Moorfields, 1816; 26, Coleman St., 1825-76.
- **George**, 49, King's Sq., 1840-42.
- **Morrice**, 40, Great Prescott St., 1842.
- Simms, Isaac**; watch B.M. about 1600.
- Simonds, Thomas**, Fleet St., admitted C.C. 1661; maker of a lantern clock, frets Fig. 306, balance escapement; 1661-70.
- **J. L.**, 19, Holborn Hill, 1820-30.
- Simons, John**, watch-case coverer, Sutton St., 1790-93.
- **G.**, 49, King's Sq., 1840-42.
- Simpkin, Benj.**, 6, Tooley St., 1800.
- Simpkins, Thomas**, C.C. 1710.
- **Benjamin**, 35, Frith St., 1800.
- Simpkinson, Roger**, 41, Fleet St., 1758-75.
- Simpson, John**, C.C. 1700-10.
- **John**, admitted C.C. 1723.
- **and Ward**, Fleet St., 1737-40.
- **William Ellison**, hon. freeman C.C. 1781.
- **Archibald**, 10, Prince's St., Leicester Sq., 1790-94.
- **Richd.**, watch-case maker, 19, Albion Buildings, Clerkenwell Close, 1793.
- **Hector**; card B.M., "H. Simpson, 9, Old Bond St., foreman to the late Mr. Fladgate," 1785; 127, Pall Mall, 1788-94.
- **R.**, 19, Albion Buildings, 1790-95; 481, Strand, 1805-15.
- **John**, 6, Middle Row, Holborn, 1815-40.
- **Robert**, 55, Park St., Dorset Sq., 1835-40; 15, New St., 1842.
- **Robert, junior**, 11, Great Castle St., Regent St., 1840.
- **Thos.**, Oxford St., 1835-42.
- Sims, Geo.**, 1738. (See Addis, W.)
- **John**, 64, Lombard St., 1773-78.
- **Henry**, Canterbury, maker of long-case clocks, about 1780.
- Sinclair, Chas.**, 69, Old St., 1835-42.
- Sinclare** —, Dublin; watch, 1782.
- Sinderby, Francis H.**, 14, Devereux Court, Strand, 1790; livery C.C. 1810; 18, Bull and Mouth St., 1816-40.
- Sindry, Lawrence**, C.C. 1661.
- Singleton, Jno.**, Lancaster, 1806.
- Skeggs, Wm.**, London; long-case clock, about 1760.
- **L.**, 355, Rotherhithe St., 1788-1810.
- **Wm.**, 355, Rotherhithe St., 1816-40.
- Skerrow, Jas.**, Lancaster, 1783.
- Skerry, W.**, Dartmouth St., Westminster, 1835-42.
- Skinner, Matthew**, master C.C. 1746; 1730-47.
- **Chas.**, 23, Pool Terrace, City Rd., 1840.
- Slack, Joseph**, admitted C.C. 1723.
- Slade, J. L.**, London; watch, 1790.
- Slater, W.**, 13, Ship Alley, Wellclose Sq., 1835.
- Sloagh, William**, C.C. 1687.
- Sloper, Jeremiah**, C.C. 1726.
- Sly, Robert**, admitted C.C. 1720.
- Smalle, Lewis**, received payments for "keeping the clock" of Lambeth parish church, 1585-1605.
- Smalley, Thomas**, admitted C.C. 1687; maker of a clock at Battle Abbey, Sussex; 1687-1700.
- **Jno.**, Lancaster, 1721.

- Smart, John**, admitted C.C. 1682.
 — **Orpheus**, 1750.
 — **Benjamin**, 35, Frith St., 1800–18.
 — **Thomas**, 4, Little Ryder St., St. James's, 1816–30.
 — **Saml.**, 198, South Audley St., 1835.
 — **Alex.**, 70, South Audley St., 1835–40.
Smeaton, John, York. In the B.M. is a circular rather large silver watch by him, silver dial, outer case of leather piqué, about 1650.
Smeed, George, 17, Chapel St., Edgware Rd., 1835–42.
Smith, John, petitioner for incorporation of C.C., and one of the first assistants, 1630–49.
 — **George**, admitted C.C. 1632.
 — **Walter**, admitted C.C. 1641.
 — **Robert**, admitted C.C. 1648; warden in 1650, and died during his year of office.
 — **John**, admitted C.C. 1654.
 — **John**, admitted C.C. 1656. In 1657 Jno. Smith was fined 10s. by C.C. for putting the name Estine Hubert on a watch.
 — **David**, admitted C.C. 1662.
 — **Robert**, admitted C.C. 1695; on the disc of a long walnut-case clock appeared the inscription, "Robert Smith, Dunstable"; 1680–1700.
 — **John**, admitted C.C. 1674, clock-maker and author of "Horological Disquisitions," 12mo, published in 1694, second edition, 1708. This was probably the first book in English on clock and watch making; he also published "Horological Dialogues" in 1675.
 — **Thomas**, Gray's Inn; admitted C.C. 1700.
 — **Morris**, admitted C.C. 1702.
 — **Henry**, admitted C.C. 1703.
 — **John**, admitted C.C. 1703; maker of the turret clock at Westminster Abbey, 1730. The movement of this clock was replaced by a modern one in 1860; 1703–40.
 — **Tudor**, admitted C.C. 1717.
 — **Thomas**, admitted C.C. 1718.
 — **Obadiah**, admitted C.C. 1725.
 — **Joseph**, Chester; maker of bracket clocks, about 1740.
 — **Maurice**, Royal Exchange, 1728–32.
 — **Edward**, Bury; maker of lantern clocks, about 1730.
 — **John**, Pittenweem; maker of an 8-day musical clock, described by the namesake of the maker. The case of mahogany is seven feet high,

with fluted columns on each side of the body. The upper part of the head is ornamented with carving, fretwork, birds' eyes, and a golden bird, with expanded wings, standing in the middle of the head. There are three dial plates and a chime of sixteen bells. The work is divided into five parts, each of which has its own weight. The first is the going part; the second drives a small musical barrel, which plays a chime at the first, second, and third quarters, and plays once over a tune before striking the hour. The third part strikes the hours, and the fourth drives a large musical barrel containing eight Scotch tunes, one of which is played every three hours. The last part changes the tune. The clock plays all the eight in the twenty-four hours. The front dial plate measures about fifteen inches, and has an arch which shows the hour, minute, and seconds, with the day of the month, and day of the week. When Sunday comes these words cast up, "Remember Sunday." At twelve o'clock on Saturday night the clock stops playing till twelve strikes on Sunday night. When the clock begins to play there is a procession of moving figures representing the City Guard of Edinburgh. The maker of this clock exhibited it at a coffee-house in Edinburgh in 1774, and tried to dispose of it by lottery. Lord Provost M'Grady, of Dundee, has another musical clock by the same maker.

- Smith, Susanna**, apprenticed to Hannah, wife of Jas. Wilson, 1747.
 — **Wm.**, Lancaster, 1767.
 — **Gabriel**, Chester, 1773.
 — **Jas.**, Chiswell St., 1758–60.
 — **Jas.**, White Horse Court, Bishops-gate, 1776–90; all sorts of clocks and watches made, mended, and sold by James Smith in White Horse Court, Whitecross St., watch paper, Ponsonby collection, about 1770; Bishops-gate, 1776–90.
 — **Geo.**, 110, Wood St., 1770–76.
 — **James**, 115, Fleet St., 1760–80.
 — **William**, Cheapside, 1759; 32, Cornhill, 1769–80.
 — **and Sharp**, 14, Bartholomew Close, 1780–85.
 — **Richd.**, Cloak Lane, 1780–85.
 — **Joseph**, 49, Lombard St., 1783–90.
 — **Geo.**, 4, Huggin Lane, 1783–90.
 — **Jas. and Son**, 118, Bunhill Row, 1769–94.

Old Clocks and Watches and their Makers

- Smith and Wareham**, Davies St., Berkeley Sq., 1790.
- **Jabez**, 16, Fenchurch St., 1790.
- **Walter**, 98, Bishopsgate St., 1795.
- **Chas.**, 118, Bunhill Row, 1790-1823.
- **James** (clockmaker to George III.), Jermyn St., 1776-94; hon. freeman C.C. 1781.
- **John**, 143, Houndsditch; livery C.C. 1776-90.
- **Wm.**, 170, Wapping, 1800-4.
- **Wm.**, 3, Bridgewater Sq., 1803-10.
- **Jas.**, 98, Oxford St., 1790-1815.
- **and Asprey**, 4, Bruton St., 1817.
- **Samuel**, Coventry; patented (1812, No. 3620) a vertical escape wheel with five teeth. Several watches were made on this plan; 7, Clerkenwell Close, 1819-22.
- **H. D.**, London; watch, with hare and snail on plate as a guide to regulation, 1808.
- **George**, Charlotte Terrace, New Cut, 1820.
- **William**, 35, Poultry, 1823.
- **John**, 27, Cornhill, 1825.
- **and Co.**, Piccadilly, 1825.
- **T. W.**, 27, Fenchurch St., 1820-30.
- **B.**, 12, Duke St., Lincoln's Inn Fields, 1830.
- **G.**, 11, St. Martin's Churchyard, 1823-30.
- **J.**, 256, Borough, 1825-30.
- **H.**; watch-movement maker, 12, Berkeley St., Clerkenwell, 1825-35.
- **Thos.**, 17, John St., Oxford St., 1820-35.
- **J., and Son**, St. John's Sq., Clerkenwell, 1835-42.
- **John**, 70, Charlotte St., Fitzroy Sq., 1842.
- **Joseph**, 18, Bride Lane, 1842.
- Smithyes, Wm.**, Holborn; long-case clock, about 1740.
- Smitton, Peter**, 12, Crown St., Russell Sq., 1820-35.
- Smoult, Thos.**, Lancaster, 1708; Jas., 1739.
- Smyth, Joshua**, "Steining in Sussex"; maker of lantern clocks, 1690.
- Sneeberger, Michael**, Prague; pupil of Burgi, 1605-20.
- Snell, George**, C.C. 1638-1700; maker of long-case clocks.
- Snelling, Thomas**, C.C. 1680.
- **James**, Poultry, admitted C.C. 1712; master in 1736; watch B.M.; another, Dunn Gardner collection, S.K.M.
- **Henry**, Ball Alley, Lombard St., 1769-75.
- Snoswell, William**, 24, Farringdon St., 1835-42.
- Snow, Jno.**, London; lantern clock, dated 1630.
- **John**, Sarum. "A watch the hours in the form of Diamonds, the Out-case holes with bizels for the sound of the Bell" (*Lond. Gaz.*, March 29, April 1, 1680).
- Soar, Jas.**, 5, Paradise St., Finsbury, 1842.
- Soffleur, Thos.**, London, 1680.
- Solomon, Hy.**, Coventry St., 1775.
- **S. C.**, 13, St. Mary Axe, 1794-1804.
- **Moses**, King St., 1810; Bevis Marks, 1820; Great Alie St., 1830.
- **Henry**, 46, Duke St., Aldgate, 1835.
- **Henry, and Co.**, 31, Houndsditch, 1840-42.
- **P.**, 26, Mansell St., 1840-42.
- **J.**, 24, Great Prescott St., 1842.
- Somersal, John**, admitted C.C. 1708.
- Somersall, George**, Leadenhall St., 1750; Finsbury, Moorfields, 1779.
- **Richard**, Finsbury Pl., Moorfields, 1776-1804; livery C.C. 1786.
- Sones, Thos.**, watch-case maker, 6, Lillypot Alley, 1790-94.
- Soret, Pierre**; watch in enamelled case, about 1620 (see p. 120).
- South, Joseph**, admitted C.C. 1709.
- Southan, Saml.**, 28, Red Lion St., 1790-94.
- Southwarth, John**, C.C. 1639.
- Southworth, Peter**, C.C. 1664.
- Sowerby, Jno.**, 100, Brick Lane, 1817; 79, Chiswell St., 1830.
- **Thomas**, 124, Long Acre, 1830.
- Sowter, John**, admitted C.C. 1683.
- Sparkes, Nicholas**, presented C.C. with a piece of plate in lieu of serving as steward, 1659.
- Sparrow, Thos.**, 113, Leadenhall St., 1790-94.
- **Jno.**, 15, Leicester St., Leicester Sq., 1815-18.
- Speakman, Thomas**, C.C. 1685.
- **Edward**, admitted C.C. 1691.
- **John, junior**, C.C. 1706.
- **William**, master C.C. 1701; 1690-1715.
- Spear, Jacob**, musical clockmaker, 39, Myddelton St., 1835.
- Spence, John**, London. In the B.M. is a round silver watch by him, silver dial, matted ground with Roman hour numerals engraved on polished lozenge-shaped plaques, day of the month shown on outer circle, glass over dial; 1650-70.
- **—**, Dublin; watch, 1750.

- Spencer, Thomas**, Strand, threatened with prosecution by C.C. for undue taking of apprentices, 1682; admitted C.C. 1685.
- **Arthur**, admitted C.C. 1732.
- **and Perkins**, 44, Snow Hill, 1775-94.
- **W.**, London; watch, 1785.
- **J.**, 20, Red Lion St., Clerkenwell, 1820-30.
- Spiegelhalter, G.**, musical clockmaker, 6, Mount Place, Whitechapel, 1835-42.
- Spink, Marshall**, 1 and 2, Gracechurch St., 1772; afterwards Spink and Son, 1772-1842.
- Spittle, Richard**, admitted C.C. 1699; maker of a tall walnut long-case clock, brass dial, with arch riveted on, containing Father Time on wing, with the words, "Tempus fugit," 1699-1720.
- Spitz, Gaspar**, Schwartz; clock, square case, flagree covers over the dials, Vienna Treasury, about 1590.
- Spratnell, Sam.**, Cockspur St., 1793.
- Springer, Sam.**, clock, about 1810.
- Spurrier, John**, admitted C.C. 1684.
- Spyer, J., and Solomon**, 26, Prescott St., 1793-1804; 20, Leman St., 1825.
- Stables, Thomas**, admitted C.C. 1685.
- Stacey, John**, admitted C.C. 1683.
- **William**, maker of a bell-top mahogany-case bracket clock, about 1750.
- Stafford, John**, admitted C.C. 1708.
- **T.**, Chelsea, 1810-20.
- Stainsburg, Robert**, Chippenham. "A silver watch with a black Fish-Skin case, studded with silver, Robert Stainsburg, Chippenham, engraven on the Dial Plate" (*Lond. Gaz.*, Aug. 29, Sept. 1, 1698).
- Stainton, Matthew**, 1, Aldermanbury, 1772.
- Stallard, Philip**, 3, New Sq., Shoe Lane, 1793.
- Stamp, J.**, 86, Cheapside, 1775 (see Sutton and Son, also Godbehere).
- Stamper, Francis**, at "ye Golden Ball in Lumbard Streete," a good maker; admitted C.C. 1682. In 1687 ordered by the C.C. to be prosecuted for refusing to admit to his workroom master and wardens when they were upon a search, but he submitted himself to the court, and was fined 20s.; maker of a clock with square dial on a lantern movement; 1682-1700.
- **John**, 148, Fleet St., 1772.
- Stanbury, Henry**, admitted C.C. 1709; maker of a thirty-hour long-case clock; 1709-20.
- Standish, William**, C.C. 1668.
- Stanes, Jeffery**, admitted C.C. 1686.
- Stanger, Hugh**, 46, Old St. Rd., 1835-40.
- Stanley, John**, admitted C.C. 1732.
- Stanton, John**, admitted C.C. 1692.
- **Edward**, Leadenhall St.; admitted C.C. 1662; master, 1696.
- **Joseph**, admitted C.C. 1703.
- **Samuel**, London; maker of lantern clocks; admitted C.C. 1714.
- Staples, Jas.**, 7, Rosoman St., Clerkenwell, 1788-94.
- Stapleton, Thomas**, C.C. 1694.
- Staptoe, William**, Charing Cross, admitted C.C. 1703; 1703-1710.
- Starey, John**, 4, Sweeting's Alley, Cornhill; 1770-94, livery C.C. 1787.
- Starkey, Joseph**, admitted C.C. 1706.
- Starr, Robt.**, C.C. 1667.
- Startridge, Roger**, Graveyard; clock, about 1750.
- Stauffer, Robert, and Co.**, 43, Skinner St., Clerkenwell, 1830-42.
- **Robert, Son, and Co.**, Snow Hill, 1830-42.
- **Julius**, 43, Skinner St., 1830-42.
- Staunton, Edward**, Leadenhall St., C.C. 1662 (see Stanton), "a new Gold Clock-Watch graved with a cypher, on the back Edward Staunton, maker" (*Lond. Gaz.*, Nov. 16-19, 1696).
- Stayne, Thomas**, admitted C.C. 1654.
- Stedman, J.**, Red Lion St., 1790.
- Steele, F.**, 71, Oxford St., 1825-33.
- Steers, Jno.**, 9, Pall Mall, 1793.
- Stegar, John**, admitted C.C. 1699.
- Steibel (or Stebbell), Christopher**, Augsburg; striking clock with minute hand, also square clock with cupola by him, Vienna Treasury, 1635-60.
- Steil, Jno.**, Edinburgh, watch, h.m. 1782.
- Steinmann, Daniel**, 29, North Audley St., 1840-42.
- Stephens, Francis**, C.C. 1632.
- **Joseph**, Whitechapel, admitted C.C. 1721; master, 1752.
- **Joseph**, 32, Aldgate, master C.C. 1776; 1760-90.
- **Thomas**, 93, Strand, 1823.
- Stephenson, Benjamin**, 5, Ludgate Hill, 1774-77.
- **William**, 27, Lombard St., 1793. (See Stevenson and Farrow.)
- **Thos. Sam.**, Hoxton, livery C.C. 1810.
- **D. W.**, 27, Lombard St., 1820-30.
- Sterck, William**, Portugal St., Lincoln's Inn, 1760-68; 16, Poland St. 1793.

- Sterck (Sterk), William**, Cockspur St., 1772-90.
- Sterling, Josh.**, London; watch, 1791.
- Steuart, James**, 8, Green St., Leicester Sq., 1790.
- Stevens, Samuel**, Grub St., admitted C.C. 1680; threatened in 1682 with prosecution by C.C. for undue taking of apprentices.
- **Daniel**, admitted C.C. 1661.
- **George**, admitted C.C. 1673.
- **Thomas**, admitted C.C. 1700.
- **Nathaniel**, admitted C.C. 1702.
- **Samuel**, admitted C.C. 1706; maker of a square dial lantern clock, cherub corners, inscribed "Sam Stevens, Londini, fecit," on circle; 1706-18.
- **Richard**, C.C., 1715.
- **Joseph**, 32, Aldgate Without; master C.C. 1752 and 1756; 1745-94.
- **Samuel**, "20, Princes St., nere Spittlefields Church," card, Ponsonby collection, about 1780; 26, Whitechapel, 1790-93.
- **W.**, 31, Ironmonger Lane, Old St., 1835.
- **Ezek.**, 49, King Terrace, New North Rd., 1840-42.
- **William, junior**, 11, Ironmonger St., 1840-42.
- **William**, 14, Bartholomew Sq., St. Luke's, 1840-42.
- **D.**, 5, New Gloster St., Hoxton, 1842.
- Stevenson**, —, Dublin; centre seconds clock watch, about 1760.
- **Adam**, summoned to livery C.C. 1786.
- **and Farrow**, 27, Lombard St., 1810-24.
- **J.**, Bethnal Green Rd., 1835.
- Stewart, Jno.**, 99, Wood St., 1793.
- Stewart, Joseph**, 61, Red Lion St., 1842.
- Stiebel, B.**, 5, Chandos St., 1823.
- Stiles, John**, admitted C.C. 1704.
- **Nathaniel**, Wood St., admitted C.C. 1725, master 1751; 1725-70.
- **Richard**, probably son of the above; master C.C. 1790; 1770-90.
- **William**, 28, Tottenham Court Rd., 1835.
- Still, Francis**, admitted C.C. 1699.
- Stillard, Geo.**, London; watch, 1815.
- Stimmer, Richd.**, Roe Buck Court, Chiswell St., 1780.
- Stimson**, —, London; bracket clock, engraved plate, knife suspension, about 1710.
- Stirling, John**, 38, Abchurch Lane, 1788.
- Stirrup, Thomas**, published "Hoo-
- meter; or, Complete Dialist," in 1652.
- Stoakes, J.**, London; watch, Dutch style, Schloss collection, about 1765; another about 1780.
- Stock, Jabez**, Whitechapel, maker of a long black narrow-case clock, with Japanese decoration down the front, and a small circular glass in the door, about 1700; in the panel the following:—
- "I labour here with all my might,
To tell the time by day and night;
In thy devotion copy me,
And serve thy God as I serve thee."
- Stockwell, Hy.**, Bells Buildings, 1793.
- Stoddart, Robert**, 61, Red Lion St., Clerkenwell, 1815-1842.
- **J.**, 7, Charles St., Northampton Sq., 1835-1840.
- **James**, 13, Red Lion St., 1825-42; died at Hastings, 1886, aged 80.
- Stogden (Stockten), Matthew**, worked for Graham; invented improved repeating motion about 1712 (see p. 356); admitted C.C. 1717; died in abject poverty, at an advanced age, in 1770.
- Stokes, Henry**, Turnmill St., Clerkenwell; bequeathed his best clock to Robert Stokes, 1586.
- Stone, Andrew**, admitted C.C. 1699.
- **William**, admitted C.C. 1700.
- **Roger**, admitted C.C. 1710.
- **Samuel**, 8, London Rd., 1820.
- Stones, Thomas**, Lothbury, admitted C.C. 1692, master 1730; watch, 1735.
- Storer, Robert**, born 1721; started business at 11, Berkeley Court, Clerkenwell, about 1743; Robert and James Storer, his sons, at the same address, 1768; James retired; Robt. Storer and Son, 1788; Robert Storer, the elder partner, who was grandson of the first-named Robert, retired to Olney, Bucks, in 1820, and died in 1832, aged 86; Robert and Walter Storer, 1822; Walter, who was great grandson of the first-named Robert, retired about 1840, closing a business carried on at the same address for nearly a century, and died at Olney in 1865, aged 65.
- **Egbert**, cousin of Walter Storer, an excellent watchmaker, was apprenticed to Henry Dashper, and resided for some time at 46, Myddelton Square; he went to Switzerland in 1871, returned to London in 1892; died 1897, aged 86.
- Storey, James**, admitted C.C. 1703.
- **Charles**, Sidney Alley, Leicester Fields, 1758-60; 1, Poultry, 1743.

- Storey, J.**, 176, Regent St., 1830.
- Storie, W.**, 8, Warwick St., Charing Cross, card, Hodgkin collection, about 1810.
- Storr and Gibbs**, London; watch, 1745.
- **Marmaduke**, 20, Lombard St., 1760-74.
- **William**, Jermyn St., 1765; 44, St. James's St., 1779-94; hon. free-man C.C. 1781.
- **and Mortimer**, 13, New Bond St., 1830-42.
- Story, William**, Red Lion St., Clerkenwell, 1760-72.
- **Hy.**, 7, Charterhouse Lane, 1820.
- Stracey, John**, 34, Prince's St., Lothbury, 1790.
- Strachan, Andrew**, a Scotsman; to avoid prosecution for practising his art in the City of London he bound himself apprentice to Thomas Warden; the Chamberlain ordered the indenture to be cancelled, as Strachan was between thirty and forty years old, 1691.
- See McCabe, and also Murray.
- **A. and J.**, 125, Long Acre, 1830.
- Straiton (or Straton), Archibald**, Edinburgh, about 1780.
- **Alexander**, a clever watchmaker; apprenticed to Reid and Auld, St. Martin's Lane, 1820; 146, Leadenhall St., 1825; 15, Little Knight-rider St., 1842; died 1873, aged 83.
- Stram, Alfred**, Ashby St., Clerkenwell; born in Switzerland, died 1893, aged 80. An excellent watch-case maker, who succeeded Comtesse.
- Stratford, George**, admitted C.C. 1704.
- **Jas.**, London; enamelled watch, about 1790.
- Stratton, Richard**, C.C. 1720.
- **Jno.**, 133, Bunhill Row, 1816-25.
- **Joseph**, Church St., Hackney, 1810-35.
- Strell, Christopher**; watch, Vienna Treasury, oval case, of brass gilt, about 1625.
- Street, Richard**, admitted C.C. 1687, warden 1715; maker of a clock costing £50, which was presented by Sir Isaac Newton to Dr. Bradley, Master of Trinity College, Cambridge, in 1708; 1680-1716.
- Strelly, Francis**, admitted C.C. 1665.
- Stretch, Benj.**, Bristol, quarter repeating watch, about 1750.
- Stretton, Sarah**, admitted C.C. 1710.
- Stribling, Benjamin**, Stowmarket; known as a maker of lantern clocks, about 1700.
- Strigel, William F.**, St. James's St., 1760-75.
- Strigel, George Philip**, Stafford Row, near Buckingham Court, 1760-88; hon. freeman C.C. 1781.
- Strigner**, —. In the B.M. is a watch by him in an outer case of carnelian. It was made for James II., and by him given to his daughter Catherine, Countess of Anglesey and Duchess of Buckingham, about 1687.
- Strixner**, —. London; watch, Evan Roberts collection, about 1745.
- Strong, T.**, London; watch; 1823.
- Strongfellow, John**, C.C. 1691.
- Stroud, Robt.**, London; watch, 1822.
- **Elizabeth**, 5, Henry St., Pentonville, 1835-40.
- Strutt, J. D.**, London; watch, 1790.
- Stubb, Thos.**, London; long-case clock, about 1690.
- Stubbs, Gabriel**, admitted C.C. 1675; described as a small clockmaker (watchmaker?) and a celebrated member of the Company; 1675-77.
- **and Co.**, London; on watch movement, about 1760; on dial, Leyden, London.
- **J.**, Prince's St., Leicester Sq., 1830; 28, Panton Street, Haymarket, 1830; gold chronometer half-quarter repeater, gold dial, raised numerals, 1819.
- **Joseph**, 241, Holborn, 1793.
- Stuk, William**, Cockspur St., 1781.
- Stumbels, B.**, London; watch, about 1760.
- Style, Nathaniel**, Wood St., admitted C.C. 1725, master 1751, livery 1766; 1725-70.
- **Richard**, 3, Carey Lane, Foster Lane; livery C.C. 1766, master 1790; 1764-96.
- Sudbury, John**, admitted C.C. 1686.
- Sudlow, Benj.**, Yarmouth; watch, about 1780; monogram, J.D.C., on balance-cock.
- Sully, Henry**, apprenticed to Charles Gretton, admitted C.C. 1704; an eminent man who settled in France; died 1728 (see p. 214).
- Summer, William**, C.C. 1662.
- **Francis**, 26, Greek St., Soho, 1790-94.
- Summers, Chas.** London; watch, Schloss collection, case beautifully enamelled, about 1785.
- Supple, John**, Vigo Lane, Piccadilly, 1783.
- Sutherland, D.**, Leith; clock, belonging to Mr. Wm. Collie, Manitoba, with moving figures representing Adam and Eve in the Garden of Eden, apparently about 1775.
- **Thos.**, 2, Vigo Lane, 1793.

- Sutor, Wm.**, Edinburgh, 1712.
Sutton, Isaac, admitted C.C. 1662.
 — **Wm., and Co.**, 85, Cheapside, 1790-93; card, Ponsonby collection, "successors to Mr. Stamp."
Swain, —, London; watch, 1832.
Swale, Jaques (alien), threatened with prosecution for working as clock-maker in liberties of C.C. 1668.
Swannell and Co., Staples Inn, Holborn, 1790-94.
Swannick, G., 38, Banner St., 1820.
Swanson, Robert, admitted C.C. 1730.
 — **William**, 5, Banner St., 1790.
 — **Sweman**, —, London; watch, probably Dutch, about 1730.
Swearer and Sons, wooden clock-makers, 7, Upper East Smithfield, 1820.
 — **J.**, 30, Park Terrace, Regent's Park, 1840-42.
Sweeby, John, admitted C.C. 1671; maker of a fine long inlaid-case clock, period William III., 1671-1700.
Swetman, Thos., London; watch about 1740; another, engraved "Sweteman, London," *repoussé* case with enamelled centre, Schloss collection, about 1760.
Swift, M., 68, Red Lion St., Clerkenwell, 1793.
 — **Thomas**, Essex St., Islington, lever pallet maker, 1825-67.
Swindells, Jasper, watch-case maker, Salmon and Ball Court, Bunhill Row, 1800-13.
Swinden, Francis Charles, born in Brentford, settled in Birmingham; at Bath St., 1824; 91, New St., 1825; afterwards at Temple St.
Sword and Sons, Cornhill, 1838.
Sydenham, H. and J., 126, New Bond Street, 1800-4.
 — **J.**, 126, Bond St., 1816-23.
Sylvester, John, admitted C.C. 1693.
Symes, Robt., London; long-case clock, about 1800.
Symonds, Thomas, 57, Cheapside, 1770-75; 20, Fleet St., 1755-88.
Taber, Thos., 29, Compton St., Clerkenwell, 1825.
Tailour, Edward, clockmaker, admitted to Blacksmiths' Co. 1629.
Tallans, Gabriel, about 1720.
Tallibart, Louis, 48, Rathbone Place, 1842.
Tallis, Aaron, admitted C.C. 1722.
Tanner, Joseph, admitted C.C. 1682.
 — —, clock engraver and varnisher, Fleet Market, 1790-94.
Tapp, Francis, 85, Strand, 1775-85.
Tarman, J. B., 34, Regent St., Piccadilly, 1825.
Tarleton, Wm., Liverpool, 1790.
Tarts, J., London; watches for the Dutch market, 1755-90.
Tate, Ruth, East Sheen; oak long-case clock, about 1790.
Tatum, Jno., 53, Dorset St., Salisbury Square, 1817.
Tavan, Antoine, born at Aost, France, 1749, died at Geneva 1836. An excellent watchmaker who wrote an analysis of various escapements.
Tavernier, Etienne, inventor of mechanism for complicated watches, 1800.
Tawney, Pepe, watch about 1700.
Taylor, a well-known family among the London watchmakers from 1640 till past the middle of the present century.
 — **Thomas**, admitted C.C. 1646, master 1668.
 — **Richard**, admitted C.C. 1655.
 — **Abraham**, admitted C.C. 1668.
 — **William**, admitted C.C. 1682.
 — **Thomas**, Holborn, at the end of Fetter Lane, admitted C.C. 1685, master 1710; maker of a fine pair-case *repoussé* repeating watch, gold dial, 1685-1715.
 — **John**, admitted C.C. 1687. "Lost between Pickadilly and St. James Street, a gold watch made fast in a gold studded case, with high pins at each hour; made by Mr. Taylor, at the Upper End of Fetter Lane, in Holborn. Whoever brings it to Mr. Harrison, Goldsmith, etc., the Three Flower-de-Luces, in the Strand, shall have a guinea reward" (*Lond. Gaz.*, Feb. 9-12, 1692).
 — **Jasper**, in Gray's Inn, admitted C.C. 1694. On a pair-case copper verge watch, outside case of leather, with many small rivets, lock-spring projecting through the dial, is the inscription, "Jasper Taylor, in Holbourn."
 — **John**, admitted C.C. 1702.
 — **George**, admitted C.C. 1703. To him and his wife Lucy, Rebecca Fisher was bound apprentice in 1715.
 — **Charles**, admitted C.C. 1723.
 — **Richard**, admitted C.C. 1724.
 — **Jasper**, of Bernard's Inn, admitted C.C. 1729; took an active part in the affairs of the Company; was master in 1754, and clerk from 1760 to 1770, when he died, leaving £10 to C.C. for the poor.
 — **Henry**, London; watch, 1760.

Taylor, Jno., Lancaster, 1772.

— **Benj.**, Ball Alley, Cornhill, 1793; 45, Lombard Street, 1798–1800.

— **and Samuel**, London; watch about 1800.

— **Samuel**, 10, Ball Alley, Lombard St., master C.C. 1807; 1788–1810.

— **Edward**, livery C.C. 1810. In the B.M. is a curious watch of his, with symbolical figures and texts of Scripture in the enamel on the dial and case, 1800–30.

— **Edward**, 25, Leadenhall St., 1822–25.

— **Joseph**, 2, Bouverie St., 1825.

— **John, S.**, 8, Wilderness Row, 1809–40.

— **Kennard and Co.**, 3, Crescent, Jewin St., 1822–30.

— **David**, 27, Northampton Square, 1842. Between 1850 and 1864 he did a large trade with the American market.

— **Jas.**, 3, Corporation Lane, 1835.

— **Robert**, 47, William St., Regent St., 1835.

— **Charles**, 62, John St., Fitzroy Sq., 1840.

Teams, John, 25, Redcross Sq., 1790–94.

Tebball, Benjamin, C.C. 1683.

Tebbatt, Benoni, Little Old Bailey; C.C. seized at his shop a gold watch-case, both for that it was of coarse and unwarrantable gold, and also so extremely thin that it was insufficient in strength. William Brafeld, who made the case, admitted his fault, and was fined 5s., the case being broken up; 1688.

Telforth, Isaac, London; watch, 1765.

Temple, Thomas, admitted C.C. 1720.

— **J.**, London; watch, 1780; another 1800.

Templer, Charles, admitted C.C. 1673.

Tenant, Leonard, paid £37 for a new clock and chimes for St. Margaret's Church, Westminster, 1617.

Tennant, Thomas, C.C. 1668.

Terold, Henry, Ipswich; maker of a round silver watch-case with interlacing bands, silver dial, Fellows collection, about 1640.

Terrier, James, admitted C.C. 1694.

— **Thomas**, admitted C.C. 1694.

— **Mary**, admitted C.C. 1713.

Terrot, P., Geneva, about 1730.

— **and Thuillier**, Geneva, about 1750.

Terroux, l'ainé, Geneva, 1770–85.

Terry, Garnet, 54, Paternoster Row, 1785–93; clock-watch, silver embossed case, Schloss collection; is

probably by him, though apparently of rather an earlier date.

Terry, Eli, Plymouth, Lichfield County, Connecticut, U.S.A.; maker of American clocks, and patentee of equation clock in 1797; 1791–1845.

— **Isaac**, 15, King St., Clerkenwell, 1835; 35, Prince's St., Leicester Sq., 1842.

—, Thoraby, 1730.

—, Richmond, Yorks., 1820–50.

Teulings, C., 15, Charing Cross, 1793.

Thacke, Philip, admitted C.C. 1685; maker of marqueterie long-case clock, square dial, 1685–1700.

Thatcher, Geo., Cranbrook; watch, about 1760.

Thead and Pickett, Ludgate Hill, 1758–65. (See Pickett and Rundell.)

Thierry, —, Caen; watch, 1690.

Thillier, I. P., London; watch, 1745.

Thiout, Antoine, l'ainé, a clever French watchmaker, inventor of many ingenious forms of repeating work, curious clocks, etc., described in his "Traité d'Horlogerie," Paris, 1741.

Thitchener, W., 36, High St., Shadwell, 1835–40.

— **J.**, 14, Maiden Lane, Covent Garden, 1835.

— **Thomas**, 18, High Row, Knights-bridge, 1840–42.

Thomaque, Abraham, C.C. 1675.

— **Isaac**, maker of a silver repeating watch, about 1729.

Thomas and Evans, Staining Lane, 1793.

— **John**, 55, St. James's St.; verge watch movement by him in Guildhall Museum; another example, watch with cylinder escapement, 1790–1804.

— **Jno.**, 153, New Bond St., 1810.

— **Richard**, 98, Strand, 1793–1804; 17, Bridgewater Sq., 1817.

— **Thomas**, 314, Borough, 1825.

— **and Son**, 3, Strand, 1825–30. Wm. Thomas, of 3, Strand, retired to Brompton, and died 1869, bequeathing £200 to the Watch and Clockmakers' Benevolent Institution.

— **F. L. and J. W.**, 153, New Bond St., 1821–30.

— **John**, New Rd., St. George's East, 1835.

Thomegay, Mark, Moorfields, 1768.

Thomlinson; lantern clock, about 1670, inscribed, "Geo. Thomlinson, in George Yard, in Lumbard Street, fecit."

Thompson, John, admitted C.C. 1662.

— **Robert**, admitted C.C. 1681.

— **Isaac**, admitted C.C. 1699.

— **William**, admitted C.C. 1708.

- In the Nelthropp collection is a watch "William Thompson, Chester," date mark, 1703.
- Thompson, John**, admitted C.C. 1720.
- **Troughton**, admitted C.C. 1731.
- **Ann, and Son**, Red Lion St., Clerkenwell, 1790-94.
- **James**, Bride Lane, Fleet St., 1790-94.
- **John**, 10, Red Lion St., Clerkenwell, 1765-94.
- **W.**, Skinner St., Clerkenwell, 1790.
- **Thomas, and Storrs**, 16, Staining Lane, 1817.
- **E.**, 32, Exeter St., Sloane St., 1835-40.
- **John**, 19, Red Lion St., Clerkenwell, 1835; died 1847.
- **Hy.**, London; watch, 1838.
- **William**, 5, Great Tower St., 1840-42.
- **Edward John**, born 1815; apprenticed to Hugh McLachlan, 1829; Wellington St., St. Luke's, 1842; 5, Percival St., 1848; Goswell Rd., 1871; Aldersgate St., 1878; died 1896. He was a trustee of the Horological Institute, and twice master of the Clockmakers' Company.
- **C.**, London, about 1760; pair-cased watch by him, outer case enamelled blue; exhibited at the Guelph Exhibition by Mr. Geo. Carr Glyn.
- Thomson, Philip, and Son**, 11, Exeter Court, Strand, 1769.
- **Adam**, 25, New Bond St. A very able man; published "Time and Timekeepers" in 1843; 1830-60; afterwards Thomson and Profaze.
- Thorlet, Jonas**, London; long-case clock, about 1760.
- Thorn, Thomas**, 23, Wood St., Cheapside, 1758-69.
- **Robert**, 12, Wood St., Cheapside, 1760-68.
- Thorne, Simon**, London; fine bracket clock, pull repeater on eight bells, about 1750.
- **J. Travis**; long-case clock, about 1760.
- **John**, 56, Whitechapel, 1790-1818; John, and Son, 56, Whitechapel, 1820.
- **James**, Limekiln Hill, Limehouse, 1835-42.
- Thorne, John**, 49, Rahere St., 1842.
- Thornton, Henry**, C.C. 1699.
- **John**, admitted C.C. 1731.
- **Jas.**, London; watch, B.M., h.m. 1771.
- **Thos.**, London; watch, 1796.
- Thorogood, John**, admitted C.C. 1660.
- **William**, admitted C.C. 1660.
- **Richard**, 175, Fenchurch St., 1783-90.
- **Etinne**, 9, Burrows' Buildings, Blackfriars Bridge; Thorogood, Stefano, same address; card, B.M., about 1770; watch, Thoroughgood, S., London, about 1772.
- Thorowgood, L.**, London; long-case clock, about 1770.
- Threlkeld, William**, London, 1700.
- "A silver watch with an engraved Case and a Cipher, G. K., in the middle, the Dial Plate having Flower-de-luces at the half-hours, the Maker's name, W. Threlkeld, London" (*Lond. Gaz.*, May 12-15, 1701).
- Threlkell, R.**, London; watch, 1750.
- Thuret, J.**, Paris; Boulle clock, S.K.M., about 1700.
- Thwaites, Ainsworth**, Rosoman St., Clerkenwell; made the Horse Guards clock, 1756; 1740-80.
- **Jas.**, Ratcliff Highway, 1768-90.
- **John**, 4, Rosoman St., Clerkenwell; master C.C. three times, 1815, 1819, 1820; presented to the C.C. Sully's timekeeper; 1780-1816.
- **and Reed**, 4, Rosoman St., Clerkenwell, 1817-42.
- Tidbury and Son**, 206, Oxford St., 1822-25.
- Tiese, J.**, London; oval watch, about 1620.
- Tilly, Joseph**, admitted C.C. 1703; walnut long-case clock, square dial, 1703-20.
- Timner, Richd.**, London; watch, 1805.
- Tinson, Thos.**, 1, Charing Cross, 1793.
- Tipping, George**, C.C. 1674.
- Tobias, Morris**, 68, Bell Dock Yard, Wapping, 1798-1800.
- **Morris, and Co.**, 68, Bell Dock Yard, Wapping, 1804. In 1812 Morris Tobias patented (No. 3584) a binuacle timepiece, to show the time by "bells," as watches are kept on board ship. On a rack lever watch, "Tobias and Co., Liverpool and London," about 1808.
- **and Levitt**, 31, Minories, 1816-42.
- Tolby, Charles**, admitted C.C. 1720.
- Tolkien and Dancer**, 145, St. John St., 1807.
- **George**, 145, St. John St., 1810.
- Toller Bros.**, London; watch, 1760.
- Tolley, Charles**, admitted C.C. 1683.
- Tollison, John**, admitted C.C. 1714.
- Tomkins, William**, 11, Winchester St., 1768-72.

Tomkinson, Humphry, Maiden Lane, Covent Garden, 1768-75.

Tomlin, Edwd., 69, Threadneedle St., 1772-88.

Tomlinson, Thomas, C.C. 1647.

— **William**, admitted C.C. 1699; master in 1733. There is a watch by him in S.K.M., h.m. 1719. Inside a fine eight-day oriental lacquer clock-case by him were directions to set up and keep a pendulum clock, and underneath, "the said clocks with all other sorts and all sorts of watches are made by William Tomlinson at the Dial and Three Crowns in Birchin Lane, near the Royal Exchange, London, now in White Hart Court, Gracechurch St."

Tomlyns, Nicholas, C.C. 1647.

Tompion, Thomas, "father of English watchmaking," Fleet St., born 1638, died 1713 (see p. 173).

— **Thomas, junior**, apprenticed to Charles Kemp, 1694; admitted C.C. 1702 (see p. 182).

— **T., and Banger, E.**, inscribed on some clocks and watches. (See Banger.)

Tompson, J., 9, Hooper Court, Clerkenwell, 1842.

Toms, T. E., 7, Swan St., Minories, 1820.

Tooke, —, Lynn; watch, 1790.

Topham, J., 9, Basing Lane, 1788-1800.

Torado, Francis, Gray's Inn; admitted C.C. 1633; maker of an oval watch in Guildhall Museum. His widow became a pensioner of C.C. in 1690; 1633-75.

Torin, Daniel, Hoxton Sq., 1766.

— **James Lewis**, 30, Throgmorton St., 1738-80.

Torkler, Peter, 9, Red Lion St., Clerkenwell, 1782-90.

Tornique, J., London; silver alarum watch by him, about 1670, exhibited at the Guelph Exhibition by Mr. Geo. Carr Glyn.

Tothaker, William, C.C. 1703.

Toulmin, Samuel, 27, Strand; maker of a centre-seconds watch, beating fullseconds, in the Guildhall Museum, cylinder escapement; 1765-83.

Toutin, Jean, Château Surr; celebrated enamel painter (see p. 122).

— **Henry**, Blois (brother of Jean) (see p. 122).

Tovey, Wm., watch and clock spring-maker, 64, Red Lion St., Clerkenwell, 1798; 53, Upper Moorfields, 1804.

Towne, Joseph, Horncastle; watch, silver dial, about 1700.

Townsend, Jno., forbidden to work by C.C. 1632.

— **Samuel**, C.C. 1702.

— **Elizabeth and John**, 61, St. Paul's Churchyard, 1760-69.

— **Elizabeth**, 119, Fetter Lane, 1804.

— **R.**, London; watch, 1815.

— **William**, 74, Fleet St., 1793; 99, Guildford Place, Spafeld, 1842.

Towson, Jno. Thos., Devonport; received Vulcan medal and £10 from Society of Arts for chronometer banking, 1826.

Trail, Edwin, 68, Old Broad St., 1835-40.

— **Edwin**, Edgware Rd., 1835-42.

Traver, Jno., watch, h.m. 1748.

Travers, Wm., Red Lion St., Clerkenwell, 1788-1810.

— **Adam**, 9, Red Lion St., Clerkenwell, 1783-94.

— **Mathew**, watch-case maker, 12, Great Sutton St., 1810.

Tregent, James, 35, Strand, 1775; 29, Cranbourne St., Leicester Sq., 1780; hon. freeman C.C. 1781; watch-maker to the Prince of Wales. A celebrated French maker, who settled in London, and was intimate with Garrick, Sheridan, and other notabilities of the theatre. The Duke of Sussex paid him £400 for a repeater and alarum travelling watch. Mr. Thos. Boynton has a long-case clock by him, about 1770, silvered dial engraved with festoons, &c., day of the month, strike silent; 1770-1804.

Trelegon, James, Strand, 1775.

— **and Ockley**, 54, New Bond St., 1793.

Trembley, J. L., Geneva, about 1710.

Trenholm, —, admitted C.C. 1728.

Trent, Wm., London; watch, about 1770.

Trewinnard, Joshua and James, 16, Rotherhithe Wall, 1790-1842.

— **Joshua**, 40, Strand, 1807-10.

— **Edward**, Grange Rd., Bermondsey, 1825.

— **James**, 32, London Rd., 1835.

— **Joseph**, 23, Grange Rd., 1835.

— **George**, Kingsland Place, 1835.

Trigg, Thomas, admitted C.C. 1701.

Triggs, Thomas, admitted C.C. 1708.

Trim, John, London; maker of house clocks, 1790-1800.

Tringham, J., London; watch, 1790.

— **Geo.**, 15, Golden Lane, 1828-42.

Tripp, Job, Bridge St., 1772.

Trippett, Robert, admitted C.C. 1700.

Trippitt, William, C.C. 1706.

Triquet, Jas., 35, Strand, 1768-72.

- Tristle, —**, Williton; hood-case clock, about 1742 (see p. 307).
- Tritschler and Co.**, wooden and musical clockmaker, 191, High Holborn, 1835-40.
- Troughton, Nathaniel**, 25, Rood Lane, 1768.
- **Joseph**, Lancaster, 1779.
- **Bryan**, 35, Fenchurch St., 1760-75.
- **Edward**, Fleet St.; invented a wheel-cutting engine in 1780, and a compensated pendulum in 1790; died 1835, aged 81.
- Troup, Jno.**, 233, Tooley St., 1822; 120, Cheapside, 1835-42.
- **W.**, London; bracket clock, about 1760.
- Trowe, Gilbert**, admitted C.C. 1722.
- Trubshaw, John**, admitted C.C. 1686; a gilt metal-cased repeating watch by him S.K.M., 1636-1715.
- Tuck, J. and L.**, 8, Haymarket, 1800-30.
- Tuckey, Giles**, London; repeating watch, 1776.
- Tudman, James**, The Crown, Lombard St., 1697-1710.
- Tuite, William**, 41, Great Queen St., 1761-75.
- Tunnell, Jno.**, 18, Fleet St., 1817-30; livery C.C. 1826; watch duplex escapement compensation balance, h.m. 1821, Mr. H. Cook.
- Tupling, B.**, 191, Strand, 1820.
- Tupman, Geo.**, Vigo St., 1790; 6, Charles St., Grosvenor Sq., 1806-30.
- **James**, Great Russell St., Bloomsbury, 1816-42.
- Turges, Josiah**, 23, Smithfield, 1768-72.
- Turlis, Jas.**, Windsor; silver watch by him, shagreen outer case, exhibited at the Guelph Exhibition by Mr. Geo. Carr Glyn.
- Turneau and Kettlewell**, 23, Villiers St., 1793.
- Turnbull, —**, London; watch, 1740.
- Turner, Joseph**, admitted C.C. 1717.
- **Thos.**, London; fine long-case clocks, about 1745.
- **William**, Church St., Spitalfields, 1760-72.
- **John**, 10, London Wall, 1788-94.
- **Wm.**, Fenchurch St., 1825-40. (See Birch.)
- **J. and Charles**, 58 and 59, New Bond St., 1830.
- Turnham, Rd.**, London; watch, 1785.
- Turpin, Benj.**, 65, Banner St., 1835-42.
- Turton and Walbancke**, 8, Fore St., 1793.
- Turvee, Jarrett**, admitted C.C. 1688.
- Tutet, Edward**, 10, Fenchurch St., livery C.C. 1766; master, 1786; 1760-94.
- Tuttell, Thomas**, admitted C.C. 1695.
- Twining, James**, admitted C.C. 1688.
- Twycross, Stephen**, Gough Sq., 1793.
- **Stephen and Son**, 8, Haymarket, 1800-4; 13, Newcastle St., 1817.
- Twyford, Robert**, 40, Strand, hon. freeman C.C. 1781; 1770-82.
- **Robert, and Co.**, 9, Finch Lane, Cornhill, 1790; 10, Salisbury St., Strand, 1800-10.
- **R.**, 20, Salisbury St., Strand, 1815-19.
- Tyas, J. A.**, watch-case maker, 77, Rahere St., 1835.
- **W. T.**, Thavies Inn, Holborn, 1820-35.
- Tyler, George**, Pope's Head Alley, maker of a bracket clock, Japanese tortoiseshell case, about 1715, also a clock-watch, 1735.
- **G.**, 15, Holywell St., Strand; watch paper, Ponsonby collection, with portrait of the Queen, and around it "Victoria, the First Queen of England," about 1840.
- **James Henry**, 24½, Northampton St., 1835.
- Tymms, A.**, 6, Kennington Lane, 1820.
- **M.**, 5, Kennington Lane, 1820.
- Tyrer, Thomas**, Red Lion St., Clerkenwell, patented in 1782 (No. 1311) the duplex escapement. His specification says, "Horizontal escapement for a watch to act with two wheels."
- **Jas., Hy.**, 32, Northampton St., Clerkenwell, 1806-30.
- **Jas.**, 65, Red Lion St., 1842.
- Udall, Thos.**, 8, Flower-de-Luce Court, 1793.
- **J.**, 5, Great New St., Shoe Lane, 1819-22.
- Uffington, Jno.**, 53, Bunhill Row, 1793.
- Ulrich, John Gottlieb**, of many addresses; 26, Nicholas Lane, in 1835; he devised and patented several methods of compensating chronometers, 1830-74.
- Underhill, Cave**, admitted C.C. 1655.
- Underwood, Wm.**, London; clock, about 1720.
- **John, and Sons**, Foster Lane, 1758-63.
- **John**, 36, Noble St., Cheapside, 1754-75.
- **Robt**, 3, Falcon St., 1769-1810.
- **Cæsar**, 3, Pantton St., 1798-1800; 9, Ranelagh St., Pimlico, 1820.
- Uneman, John and William**, Dutch

- clockmakers in England (see p. 23), 1368.
- Unwin, Edward**, 30, Upper Lisson St., Paddington, 1820.
- Upjohn, Wm.**, Exon.; watch, silver dial, raised figures, h.m. 1741.
- **James**, Threadneedle St., 1760–63; Lombard St., 1779; watch in gold and enamelled cases S.K.M., h.m. 1778.
- **James, and Wirgman**, 18, Red Lion St., Clerkenwell, 1769–81; Jas. and Co., 1794.
- **Francis**, 1, Bridgewater Sq., livery C.C. 1786; suggestive distinctive marks on foreign watches, 1780–87.
- Brentford: watch, 1810.
- **W. J.**, 11, St. John's Sq., 1815–20.
- **Peter**, 11, Red Lion St., 1783–1835.
- **J. and T.**, 5, Chandos St., Covent Garden, 1835.
- **and Bright**, 5, King William St., Strand, 1842.
- Upton, Rich.**, London; watch, about 1755.
- Urseau, Nicholas**; there is an entry of a payment to him as a clock-maker in 1553, and on New Year's Day, 1556, he presented a clock to Queen Elizabeth.
- **Nicholas**, probably a son of the preceding, clockmaker to Queen Elizabeth, 1572–90.
- Usherwood, William**, 19, Strand, 1830.
- Uytemveer, C.**, Rotterdam; watch, about 1705.
- Vale, Samuel**, Coventry, 1747.
- **Wm.**, 6, Colemore Rd., Birmingham, 1770. (See also Gimblet)
- **Howlett, and Carr**, Coventry, 1754–90.
- **and Rotherham** (R. K. Rotherham apprenticed to Vale, Howlett, and Carr), 1790–1840.
- **Wm.**, 12, Bunhill Row; a good maker, mentioned by Earnshaw; 1776–94.
- **William**, musical clockmaker, 32, Paul St., Finsbury, 1816–40.
- Valentine, Chas. D. F.**, livery C.C. 1810.
- Vallance, Thos.**, 5, Wilderness Row, 1820.
- Vallier, Jean**, Lyons; fine astronomical watch, uncased, by him, B.M., about 1610; also a watch in the Vienna Treasury, case in the form of a star, mounted in brass and silver, covered on both sides with rock crystal, about 1605.
- Vanbroff, Jas.**; watch, Soltykoff collection, about 1615 (see p. 106).
- Van Ceulen, John**, Hague; maker of a clock on Huygens' plan (see p. 203), about 1660; clock-watch, Schloss collection, about 1700 (see p. 138).
- **Phillipus**, Hague; watch, B.M., the case enamelled by J. L. Durant, about 1690.
- Vandenburg, J.**, 8, Owen's Row, 1830.
- Vanham, Leonard**, Addle St., 1737–40.
- Vanscolina, Richard**, 70, Charlotte Terrace, New Cut, 1842.
- Vantroleyer, James**, one of the first assistants C.C., 1630; a watch by him of an earlier date, Nelthropp collection.
- Vardon, Samuel and Thomas**, 29, Frith St., Soho, 1783–94.
- Vaslet, Andrew**, admitted C.C. 1717.
- Vaucher, Fritz**, 27, Gerrard St., Soho, 1842.
- Vaughan, Geo.**, Greville St., Hatton Garden, 1816–28.
- Vaugner, Robt.**, Blois; a celebrated painter in enamel of watch cases; died 1670.
- Vauguion, Daniel**, Spring Gardens, 1790–93.
- Vautrollier**. (See Vantroleyer.)
- Vautyer, —**, Blois; maker of a handsome octagonal watch, B.M., case decorated with filigree work and jewels, 1620.
- Vecue, Thomas**, admitted C.C. 1632.
- Vere, John Henry**, 48, Lombard St., 1769.
- Vernon, Christopher**, in "ye Great Turnstyle, Holborne," maker of lantern clocks, about 1650.
- **Samuel**, admitted C.C. 1649, master 1679.
- **—**, admitted C.C. 1685.
- **Thos.**, watch, *repoussé* case, about 1700; also a bracket clock, about 1720.
- Verow, Jno.**, Hinckley; watch, with curiously shaped fluted pillars, about 1795.
- Vesper, J.**, Fore St., Limehouse, 1820.
- **T. and W.**, 4, Grosvenor Place, Commercial Road, 1835–42.
- Vevers, Richard**, 2, Cateaton St., 1825–30.
- Vial, Charles**, 1685. "Silver pendulum watch made by Charles Vial, with a tortoise-shell case inlaid" (*London Gaz.*, Jan. 17–20, 1697).
- Vick, Richard**, in the Strand; admitted C.C. 1702, master 1729; maker of a repeating watch inscribed "Richard Vick, watchmaker to his late Majesty"; another, about 1740 or 1750.
- Vickerman, Thos.**, "Maiden Lane,

- opposite Goldsmiths' Hall, Cheapside," card, Ponsonby collection, about 1760.
- Viel, George**, 29, King St., Soho, 1842.
- Viet, Claude**, C.C. 1698; his daughter Marianne was bound apprentice to him in 1715; a gold watch inscribed C. Viet, London, watchmaker to Her Majesty, h.m. 1729, outer case engraved, probably by him. (See also Mitchell and Viet.)
- Vieyres, Anthony**, 40, Pall Mall, 1842.
- Vigne, James**, 2, Strand, 1770-94; hon. freeman C.C. 1781.
- Villiscun, Stephen**, Church Abbey, Basinghall St., 1780-85.
- Vincent, Chas.**, London; watch, 1820.
- **John**, 157, Drury Lane, 1840-42.
- Vine, Jas.**, 2, Charing Cross, 1790-94.
- **James**, 5, Staining Lane, 1825.
- Viner, Charles Edward**, 151, New Bond St. and Royal Exchange, 1776-1820; card, B.M.; 19, Sackville St., 1840; livery C.C. 1819.
- **Charles Edward, and Hopkins**, 8, Sweeting's Alley, 1829; also 235, Regent St., 1829-42; Mr. Thos. Boynton has a fine regulator by "Viner, 235, Regent St., London," which winds at the side without opening the door, about 1835.
- Vines, James**, admitted C.C. 1708.
- **Joseph**, Newbery, Berks; maker of a curious astronomical clock. 1836.
- Virgoe, Thomas**, admitted C.C. 1682.
- Visconti, G.**, made a clock at Pavia about 1410.
- Voght (or Vogt), Auty**, 26, Upper Cleveland St., 1830-35.
- Vogt and Co.**, 35, Wigmore St., 1830.
- **Chas. and Fredk.**, 35, Wigmore St., 1836-42.
- Yoland, Elias**, admitted C.C. 1632.
- Yolk, P.**, 38, Goodge St., 1835-40.
- Yossière, Thomas**, C.C. 1698.
- Voughan, Edward**, C.C. 1715.
- **Daniel**, Charing Cross, 1775.
- **George**, 11, Granville St., Hatton Garden, 1820.
- Youloire, Matthew**, C.C. 1692.
- Voyce, Gamaliel**, admitted C.C. 1694; maker of an arch-top ebony bracket clock, pull quarters, original rise and fall, 1694-1700.
- Vuicar, J. B.**, Zug; small round watch, silver dial, about 1610.
- Yuille Brothers**, 2, Easton St., Spitalfields, 1840-42.
- Vulliamy, Justin**, carried on business at Pall Mall, in partnership with Benjamin Gray, whose daughter he married, 1730-75.
- Vulliamy, Benjamin**, Pall Mall, son of Justin, and father of Benjamin Lewis; hon. freeman C.C. 1781; 1775-1820.
- **Benjamin Lewis**, 63, Pall Mall, an eminent maker (see p. 240), 1810-54.
- **and Son**, 76, Pall Mall, 1793-1820.
- Yuolf, J. C.** (Swiss), maker of a small skull watch in the B.M., 1600.
- Wade, Henry**, admitted C.C. 1728.
- **Jos.**, Clerkenwell Close, 1793.
- Wagdon, Stephen**, C.C. 1724.
- Wagner, Johan Heinrich**, à Pirna; square table clock, about 1650.
- **E. M.**, Berne; the Hon. Gerald Ponsonby has a watch by him, pendulum vibrating under dial, very fine painting on enamel over balance cock, about 1760.
- **J.**, born 1800, settled in Paris 1821, died 1875.
- Wagstaff, Thomas**, 33, Gracechurch St., maker of watches; also a bracket clock playing four tunes at the hour, black wood case. 1769-94.
- **James**, 16, Brown's Lane, 1835.
- Waine, —**, Queen St., 1774.
- Wainwright, John**, C.C. 1679.
- Wait, Jno., and Son**, Gun Dock, Wapping, 1765-72.
- Wakefield, Wm.**, Lancaster, 1782; Timothy, 1811.
- **John**, 3, South St., Berkeley Sq., 1835-42.
- **T.**, 5, Smith St., Northampton Sq., 1835.
- Wakelin and Taylor**, Pantton St., 1788-94.
- **and Garrard**, Pantton St., 1800-5.
- Waker (Walker ?), Peter**, admitted C.C. 1663.
- Waldoe, John**, admitted C.C. 1677.
- Waldron, John**, 38, Cornhill, maker of a watch in the Massey-Mainwaring collection, gold case, *repoussé*, 1760-82.
- Waldvogel, Anthony**, 82, Ratcliff Highway, 1835-40.
- Walford, John**, admitted C.C. 1717.
- Walkden, Thomas**, C.C. 1694.
- Walker, Jas.**, admitted C.C. 1632; lantern clock inscribed "James Walker in Lowthbery, fecit."
- **George**, admitted C.C. 1633.
- **Jonadab**, admitted C.C. 1687.
- **John**, Fleet St., and afterwards at the White Horse and Bell, near Cheapside Conduit; admitted C.C. 1717; inventor of a lamp clock, 1710-30.

- Walker, Peter**, lacquered long-case clock, about 1740.
- **Ezekiel**, of Lynn, wrote an article in *Nicholson's Journal* on longitude and the use of chronometers, 1770-1804.
- **Allen**, London; watch, Schloss collection, handsome *repoussé à pour* outer case, 1783.
- **Joseph**, 1, Warwick Court, Holborn, 1790-94.
- **Wm**, 38, Fetter Lane, 1790-94.
- **R.**, London; watch, 1800.
- **D., and Son**, 49, Red Lion St., Clerkenwell, 1806-16; 46, Clerkenwell Close, 1820. (See Harlow.)
- **J.**, musical watchmaker, 7, Nassau St., Soho, 1820.
- **John**, 29, Gloucester St., Queen's Sq., 1816; 40, Princes St., Leicester Sq., 1840.
- **Thomas**, 17, Castle St., Oxford St., 1815; Thos., and Son, same address, 1820-30.
- **E.**, watch-case maker, 46, Whiskin St., 1835.
- **and Blundell**, 4, Red Lion St., Clerkenwell, 1835-42.
- **Edwd.**, 55, Red Lion St., 1839-42.
- **William**, Standish St., Liverpool, patented (1841, No. 8997) a wheel for lever escapement, in which the spaces between the teeth were portions of circles, so as to dispense with the necessity of banking pins.
- Wall, Wm.**, Wandsworth, patented an escapement in 1817 (No. 4097).
- Wallace, Hy.**, Royal Exchange, 1775.
- Waller, Richard**, maker of a watch, the time shown on a semi-circular dial by the sun at day and the moon at night, said to have belonged to William of Orange; another, showing regulator on dial, about 1750.
- **J.**, 17, Shoreditch, 1790.
- Wallis, William**, admitted C.C. 1715.
- **Peter**, Fleet St., 1737-40.
- **Henry**, Red Lion St., 1765-68.
- **Jacob**, London; clock, about 1780.
- **Jno.**, 14, Skinner St., Bishopsgate, 1825-40.
- Wallitt, Richard**, admitted C.C. 1693.
- Walloon, H.**, London; watch, 1812.
- Walsh, Arthur Paul**, a celebrated watch and chronometer maker and springer; apprenticed to T. F. Cooper; carried on business as a tool dealer, at Frith St., Soho, in partnership with Robert Oliphant, and afterwards settled in George St., Euston Rd.; born 1815, died 1893.
- Walter, Nicholas**, maker of an oval watch in the B.M., about 1620; subscribed to incorporation of C.C. 1630.
- Walton, J.**, London; watch 1807.
- **Christopher**, 24, Ludgate St., 1823-35.
- Warburton, William**, C.C. 1693.
- Ward, John**, admitted C.C. 1731.
- **Edward**, admitted C.C. 1731.
- **W. John**, Barbican; a tiny pair case gold watch, diameter of a sixpence, nearly a ball, inscribed W. J. Ward, London, about 1780.
- **Robert**, 19, Abchurch Lane, Cannon St., 1762-85.
- **Richard**, 18, Tower St., 1790-94.
- **Henry**, of Blandford, a well-known clockmaker, about 1770-90; small long-case clock, inscribed Henry Ward, about 1830.
- **John**, 9, Fore St., master C.C. 1797.
- **Benjamin**, 45, Upper Moorfields, 1790-1808.
- **John**, 39, Greek St., 1790-94.
- **Robert**, musical clockmaker, 20, Plumtree St., Bloomsbury, 1790.
- **Rich.**, 27, Banner St., 1826-42.
- Warden, Thomas**, 1691. (See Strachan.)
- **Robt.**, London; watch 1790.
- Ware, Robert**, admitted C.C. 1701.
- Wareham, John**, 18, Davies St., Berkeley Sq., 1816-23.
- Warfield, Alexander**, C.C. 1692.
- Warne, James**, 7, Queen St., Cheap-side, 1760-75.
- Warner, John**, Golden Anchor, near Temple Bar, C.C. 1682-92.
- **John**, Temple Bar, C.C. 1696-1701.
- **John**, 8, Trinity Row, Islington, 1835.
- Warnes, Robert**, 2, Leicester Sq., 1822-5.
- Warre, W. H.**, Skinner St., Snow Hill; free of C.C. by redemption 1857, assistant 1863, died 1866, leaving £100 to the Company.
- Warren, Richard**, C.C. 1668.
- Warwick, Wm.**, 88, London Wall, 1793.
- Washbourne, Thomas**, Queen Sq., Bartholomew Close, 1754-59.
- Wassell, J.**, 9, Picket St., Strand, 1830.
- Waters, John**, admitted C.C. 1646.
- **John**, admitted C.C. 1683.
- **Thomas**, admitted C.C. 1731.
- **John**, 4, Cornhill, 1775.
- Watkins, John**, 9, Giltspur St., Smithfield. Received £33 from Society of Arts for improvement in the spring detent escapement, 1804; livery C.C. 1820; Great Sutton St., 1834.
- **Joseph**, 21, Great Warner St.,

- Coldbath Fields, 1800-19; he attested the value of Earnshaw's improvements in 1804.
- Watkins**, —, 126, Drury Lane, 1820.
- Watson, William**, C.C., 1691.
- **Samuel**, Coventry, admitted C.C. 1692; inventor and maker of a curious piece of clockwork. In 1682 is mentioned a payment of £215 for a clock he sold to his late Majesty, Charles I. The clock "showes the rising and setting of the sun and many other motions" (*Lond. Gaz.*, Sep. 4-8, 1690).
- **Walter**, admitted C.C. 1720. Hatton, in 1773, mentions the astronomical or complicated work of Mr. Watson as being rare.
- **John**, Michael's Alley, Cornhill, 1780-85.
- **Thomas**, 23, Aldersgate St., 1785-94.
- **James**, 24, Arundel St., Strand, 1788-1805.
- **Wm.**, 190, Strand, 1793-1805.
- **W.**, 67, Red Lion St., Clerkenwell, 1820.
- **Edward**, 26, King St., Cheapside, 1820-42; livery C.C. 1820.
- **Wm.**, 25, North Audley St., 1842.
- Wattes, John**, admitted C.C. 1664.
- Watts, Richard**, admitted C.C. 1680.
- **Brounker**, apprenticed to Joseph Knibb, 1684; admitted C.C. 1693; a repeating watch by him in the Guildhall Museum, engraved cap, gold dial, well engraved and pierced inner case. Mr. Eden Dickson has a month clock by him; Mr. Thos. Boynton has an eight-day long-case clock of his make. "Lost, on the 21st instant, in Gutter Lane, Cheapside, a Silver Watch with Tortoise-shell Out-case, with a Lion Rampant and 3 oaken leaves for the coat, engraved on the Backside, made by Bro. Watts; the movements are the hours, minutes, and seconds. Whoever brings it to the sign of the Goldsmiths' Hall in Gutter Lane, or to Bro. Watts in Fleet Street, shall have a Guinea reward" (*Lond. Gaz.*, April 27-30, 1696).
- **John**, admitted C.C. 1712.
- **James**, admitted C.C. 1720.
- **William**, 8, Cripplegate Buildings, 1770; 8, Fore St., 1775.
- Wayland, Henry**, Stratford, 1835.
- Waylett, Jas.**, 7, Mark Lane, 1793.
- **John**, 9, Ball Alley, Lombard St., 1795-1810.
- Weadon, William**, C.C. 1695.
- Weakman, William**, C.C. 1661.
- Weare, Robt.**, Argyle St., Birkenhead. In 1846 he patented (No. 11,776) electric timekeepers.
- Weatherley and Roberts**, 9, Poultry, 1800-5.
- **and Son**, 9, Poultry, 1810-23.
- Weaver, Cuthbert**, admitted C.C. 1682.
- Webb, Charles**, Cheapside, 1737-40.
- **Peter**, 28, Throgmorton St., 1753-68.
- **Benjamin**, 21, St. John Sq., 1778-90; hon. freeman C.C. 1787; 3, Red Lion St., 1806-10; watch, with compass in dial inscribed, "By the King's Patent." This appears to have been patented by Hy. Peckham in 1798.
- **Arthur**, 86, Portland St., 1780-94.
- **Robert**, 14, Berkeley St., St. John Sq., 1815-19.
- **Edward**, 245, Tottenham Court Rd., 1616-20.
- **J.**, Seward St., 1820.
- **Wm., and Co.**, 19, Wilderness Row, 1816-20.
- **William**, 2, Northampton Terrace, City Rd., 1840; afterwards at Pullen's Row, Islington; a noted watch and chronometer maker; died 1887, aged 78.
- Webber, W.**, Woolwich, 1817.
- Webster**. Many generations of this family have carried on business in the City of London from 1675.
- **Robert**, admitted C.C. 1675.
- **John**, admitted C.C. 1695.
- **George**, admitted C.C. 1703.
- **Henry**, admitted C.C. 1709.
- **Thomas**, admitted C.C. 1709.
- **William**. The following extract from the *Lond. Gaz.*, from Nov. 24-28, 1713, respecting him, may be of interest: "On the 20th Instant, Mr. Tompion, noted for making of all Sorts of the best Clocks and Watches, departed this Life: This is to certify all Persons of whatever Quality or Distinction that William Webster, at the Dial and Three Crowns in Exchange Alley, London, served his apprenticeship, and served as a Journeyman a considerable Time with the said Mr. Tompion, and by his Industry and Care is fully acquainted with his secrets in the said Art." This William Webster was warden, C.C. 1734, and died in office, 1735.
- **William**, 26, Change Alley; master C.C. 1755; livery 1766.
- **Samuel**, livery C.C. 1766.
- **Robt.**, Whitby, Yorks. In 1772 he patented (No. 1021) a repeater.

- Webster, and Son**, 11, Change Alley, 1781-1800.
- **Richard**, 26, Change Alley, 1788-1840; livery C.C. 1810.
- **Richard**, Birchin Lane, 1842; 43, Cornhill, 1850, and afterwards at No. 5, Queen Victoria St., which he built when the thoroughfare was formed; died in 1882, aged 62; an accomplished horologist.
- **Charles**, 19, Broad St., Long Acre, 1835; 24, Red Lion St., Holborn, 1842.
- **Ambrose**, Waltham, Mass., U.S.A.; a clever mechanic, engaged in producing machines for watch construction; died 1894, aged 65.
- Weekes, Thomas**, admitted C.C. 1654; fined by C.C. in 1657 for abuse to Warden Coxeter.
- Weeks, Thomas**, admitted C.C. 1688.
- **Charles**, admitted C.C. 1713.
- **John**, clock-case maker, Great Sutton St., 1810-23.
- Welborne, William**, Leather Lane, Holborn. In 1813 fined £15 by C.C. for refusing to take up the livery, 1800-13.
- Welch, E. N.**, founder of E. N. Welch Clock Co., Forestville, New England, U.S.A., died 1887, aged 78.
- Welcome, John**, one of the first wardens of C.C. 1631-1649.
- **John**, admitted C.C. 1705.
- Welder, Thos.**, 40, Foster Lane, 1780-85.
- Weldon, Saml.**, London; watch, Nelthropp collection, date letter, 1774.
- Welke**. (See De Welke.)
- Welle, Robt.**, 30, Red Lion Sq., 1825.
- Weller, John**, admitted C.C. 1713. The Prince of Wales exhibited at the Guelph Exhibition a clock-watch by him; on the back three plumes Ich Dien and also Pro Principe Semper.
- Wellington, John**, admitted C.C. 1726.
- Wells, Joseph**, C.C. 1667.
- **John**, admitted C.C. 1682.
- **John**, 4, Cheapside, 1758-68.
- **Matthew**, Russell Court, Covent Garden, 1755-60.
- Welsh, Robt.**, Dalkeith, about 1790.
- Wentle, Jas.**, 147, Aldersgate St., 1793.
- Wescott, John**, admitted C.C. 1703.
- West, William**, admitted C.C. 1697.
- **Thomas**, completed his apprenticeship in 1694; maker of a large metal pair-case watch, elaborate dial and movement, inscribed "Thomas West, London," 1694-1710.
- **Samuel**, Royal Exchange, livery C.C. 1766; example of his work, an eight-day bracket clock, with verge escapement, in black wood case, with brass mounts and brass dial silvered, has a landscape painted at the top, with two men in the foreground playing tennis, the ball being represented by a small brass button, attached by a wire to the staff of the verge, and working backwards and forwards in a slot cut in the dial; 1750-67.
- West, Thos.**, 3, Ludgate St., 1820-42.
- Westaway, John**, 1, Gower St., 1840.
- Westbrook, William**, London, maker of long-case clocks, about 1730.
- Westfield, Robt.**, St. James's St., Clerkenwell, patented in 1813 (No. 3732) a cylinder wheel with teeth of unequal height.
- Westlake, John**, 33, High St., Boro', 1820; 41, Castle St., Boro', 1835-42.
- Westmore, Robt.**, Lancaster, 1761; Thos., 1779; Robt., 1785.
- Westoby, John**, admitted C.C. 1677.
- Weston and Willis**, enamellers, 23, Greenhill's Rents, Smithfield, 1810.
- Westwood, Richard**, admitted C.C. 1691; known as a maker of lantern clocks.
- **Robert**, Princes St., Leicester Square; in 1829 he patented (No. 5850) an eight-day watch with large barrel extending over the train.
- Wetherell and Janaway**, 114, Cheapside, 1785-94.
- Weylett, Jos.**, 7, Mark Lane, 1790-94.
- Whaley, J.**, 14, Mount St., Lambeth, 1840-42.
- Wham**, —, 13, Knightsbridge, 1820.
- Whaplett, Thos.**; prior to 1686 he presented a tankard to C.C.; Wharton Rd., London; watch, 1785.
- Wheatley, John**, admitted C.C. 1668.
- **William**, admitted C.C. 1698.
- **John**, 18, Bull and Mouth St., 1820-25.
- Wheatstone, Sir Charles**, an eminent electrician, inventor of a system of synchronous clocks driven by magnetic-electric currents; died 1875, aged 73.
- Wheeler, Thomas**, admitted C.C. 1655, master 1684; maker of a lantern clock, dolphin frets, altered balance escapement, inscribed "Thomas Wheeler, near the French Church in London"; died 1694.
- **John**, admitted C.C. 1680.
- **John**, 17, Shoreditch, 1794.
- **Maurice**, invented a rolling clock 1684.
- **Thos.**, 114, Oxford St., 1793.

- Whellan, Thos.**, "in Bishops Gate Street, Londini"; lantern clock, about 1680.
- Whichcote, Samuel**, Crane Court, Fleet St., admitted C.C. 1724, master in 1748.
- **Samuel**, 175, Fleet St., master C.C. 1764, livery 1766.
- Whiphan, Thos.**, 61, Fleet St., 1775; **Whipham and North**, 1793.
- Whipple, G. M.**, sup-rintendent of the Kew Observatory, Richmond. Initiated a system of watch rating in 1884; died 1893, aged 50.
- Whitaker, —**, Camberwell, maker of a watch at S.K.M., 1720.
- **S.**, 12, Long Lane, 1830.
- **William**, 8, High St., Camberwell, 1835-42.
- White, John**, admitted C.C. 1648.
- **Thomas**, admitted C.C. 1683; watch, gold *repoussé* case, outer case of shagreen, Schloss collection, 1743.
- **John**, admitted C.C. 1692.
- **Joseph**, admitted C.C. 1713.
- **Wm.**, 306, Oxford St., 1830.
- **John**; watch, 1829; 3, Northampton Terrace, City Rd., 1838-42.
- Whitear and Raves**, 30, Fleet St., 1790-94.
- Whiteaves, Richard**, 30, Fleet St., 1804-40; livery C.C. 1812.
- Whitebread, William**, C.C. 1728.
- Whitehead, Richard**, C.C. 1671.
- **Robt.**, 3, St. James's St., Clerkenwell, 1810-15.
- Whitehear, Richard**, admitted C.C. 1648; seems to have settled at Reading. Example of his work, a lantern clock, dolphin frets, inscribed "Richard Whiteheare, Reading, fecit"; 1640-60.
- Whitehurst, John**, Derby, and afterwards of Bolt Court, Fleet St., F.R.S.; a well-known maker of turret and other clocks, inventor of tell-tale clocks; born at Congleton 1713, died in London 1788; his descendants continued the business at Derby; clock in "The Chauntry," Newark, inscribed, "Made 1807, and fixed here 1808, by Mr. John Whitehurst, senior, of Derby."
- **and Son**, Derby; rack-lever watch, about 1805.
- Whiterow, Jno.**, 20, Bridge St., Covent Garden, 1840.
- Whitewick and Moss**, 24, Ludgate Hill, 1790-94.
- Whitfield, Henry**, C.C. 1662.
- **J.**, London, about 1740; a watch by him belonging to Mr. Geo. Carr Glyn, Guelph Exhibition.
- Whitford, Thomas**, 1, Smithfield Bars, 1790-1800; Whitford and Son, 1810-23.
- **George**, 1, Smithfield Bars, 1830-42.
- Whitlach, Jno.**, clockmaker, presented a cup to C.C. prior to 1652.
- Whittaker, Edward**, C.C. 1711.
- Whitney, John**, 42, Wynyatt St., 1842.
- Whittingham, William**, cited by C.C., he not having served seven years, 1688.
- Whittle, Thomas**, C.C. 1683.
- Whitway, Saml.**, Cheapside, 1735-40.
- Whitwell, Robert**, C.C. 1648; in 1651 he presented one cup and three spoons to the Company.
- Wibrandt, Jacob**, Leuwarden; small watch, about 1630 (see p. 492).
- Wichell, Samuel**, St. James's St.; marqueterie long-case clock, about 1710.
- Wicks, John**, 27, Cannon St.; livery C.C. 1786; 8, Clement's Lane, 1804.
- **John Haughton**, 8, Clement's Lane, 1806; livery C.C. 1810. J. H. Haughton and Son, same address, 1810-35.
- **W. G.**, 114, Leadenhall St., 1823.
- **W.**, 8, Skinner St., Clerkenwell, 1835.
- **and Netherton**, Pantons St., 1752-60.
- Wicks, William**, London, maker of long-case clocks, about 1800.
- **and Bishop**, 170, New Bond St., 1820-25.
- **Wm.**, watch-case maker, 34, Percival St., 1820.
- **W. G.**, 120, Long Lane, 1836.
- **Thos.**, 34, Union St., Kingsland Rd., 1835.
- **Alfred**, 8, Clement's Lane, 1842.
- Wicksteed, Edward**, 9, Fore St., 1768; 114, Bunhill Row, 1795.
- Widdowson, Joseph**, 100, Fleet St., 1830.
- Wideman, Jacob**, Augsburg, 1680.
- Widenham, Richard**, 6, East St., Clerkenwell, 1830; 13, Lombard St., 1835.
- **and Adams**, 13, Lombard St., 1840-42.
- Wieland, F.**, 25, Penton St., Walworth, 1835.
- **Chas.**, 12, Workworth Place, Commercial Rd., 1835-42.
- **R. and W.**, 7, Lower Rd., Islington, 1835-42.
- **Fredk.**, 14, Crosby Row, 1842.
- Wiggins, Thos.**, 129, High St., Borough, 1835.

- Wigginton, Wm.**, 11, St. James's Walk, 1806-20.
- Wight, Jas.**, 12, Union St., Southwark, 1816-20.
- Wightman, William**, C.C. 1696; the Rev. Lewis Gilbertson has a long-case clock by Thomas Wightman, very similar to Fig. 320, and dating from about 1696. William Wightman given in the List may possibly have been Thos. Wightman.
- **Thomas**, 95, St. Martin's Lane, 1798-1818.
- Wightwick and Moss**, 24, Ludgate St., 1775-1804 (John Wightwick, hon. freeman C.C. 1781).
- Wigram, Thos.**, 67, St. James's St., 1804.
- Wilcocks, T.**, 2, Red Lion St., Clerkenwell, 1817.
- Wild, Jas.**, Frith St., Soho, 1790.
- **E.** (tools), 2, St. John's Sq., 1798-1810.
- Wilde, Saml.**, Islington, maker of lever escapements, a remarkably good workman and sound horologist, 1800-42; his son afterwards in partnership with A. P. Walsh.
- Wilder, Richard**, Richmond Buildings, Soho; C.C. 1776; watch, h.m. 1785.
- **Jno.**, C.C. 1790.
- Wilders**, —, London; many watches, Dutch style, 1760-80.
- Wildman, Watkinson**, Cheapside, 1753-63.
- **Samuel**, 63, Cheapside, 1760-88.
- **Chas.**, 6, Great Newport St., 1800.
- Wilkes, Jno.**, London; watch, 1740.
- Wilkins, Robert**, C.C. 1670.
- **George**, 36, Frith St., Soho, 1810-25; card B.M.
- **Samuel**, 4, Norman St., St. Luke's, 1835.
- Wilkinson, J.**, London; watch, 1765.
- **William**, C.C. 1718.
- **T.**, 32, Piccadilly; 8, Cornhill, 1793; 1825-30.
- **James**, 18, Castle St., 1830; 19, Farringdon St., 1835.
- Willard, J.**, Boston, U.S.A., American clockmaker, 1800.
- Willcocks, Richard**, 46, Red Lion St., Clerkenwell, 1785-1800.
- Willen, Johan**, London; watch, 1720.
- Willerme, Pierre**, admitted C.C. 1648.
- Willerton, Skull, and Green**, 21, New Bond St., 1783-94.
- Willett, J.**, London; watch, silver cock, 1727.
- Williams, Joseph** (Ireland), admitted C.C. 1685.
- **Jno.**, 11, Old Bond St., 1769.
- Williams, Thos.**, Haverfordwest; watch, 1780.
- **Jas.**, 35, Goodge St., 1794.
- **P.**, London; watch, 1798.
- **John**, 168, Shoreditch, 1800-4.
- **Geo.**, 7, Bridgwater Sq., 1817.
- **John**, watch-case maker, 56, Great Sutton St., 1820.
- **E.**, 1, Albany, Saville Row, 1825.
- **John**, 4, Amen Corner, 1821; 70, St. Paul's Churchyard, 1831.
- **S.**, 16, St. John's Row, St. Luke's, 1840; Baldwin St., 1842.
- Williamson, William**, C.C. 1664.
- **Thomas**, admitted C.C. 1668. "Lost on the 19th day of August, from Mr. Will. Clinch's house at Epsom, a silver Minute Pendulum Watch with a scollop-shell case studded with silver, made by Thomas Williamson, London, with a silk string and a silver seal with a Coat of Arms. Whoever brings it to Mr. Robert Dingly, watchmaker in George Yard, Lombard Street, shall have 2 guineas Reward" (*Lond. Gaz.*, Sept. 5-8, 1692).
- **John**, admitted C.C. 1682.
- **Robert**, St. Bartholomew Lane, admitted C.C. 1666, master 1698; maker of a watch with a shagreen case in the B.M., 1666-1720.
- **Edward**, apprenticed to Jonathan Puller for seven years ending 1694; maker of a long marqueterie case clock; 1694-1720.
- **Joseph**, invented an equation clock in 1720; master of C.C. 1724, and died in office, 1725; 1700-25.
- **Timothy**, 196, Fleet St., 1769-75; 90, Great Russell St., 1788.
- **J.**, London; watch, 1790.
- Williamston, Ralph**, C.C. 1706; watch, "R. Williamson, London," S.K.M., h.m. 1749.
- **Christopher**, 24, Cornhill, 1840-42.
- Willin, Wm.**, Percival St., 1800-11; livery C.C. 1810.
- Willing**, —, London; calendar watch, one hand, nicely engraved dial, Schloss collection, about 1720.
- Willis, Mary**, 81, Bishopsgate St. Without, 1822-5.
- **Jno.**, enameller, 23, Greenhill's Rents, 1823; afterwards Percival St.
- **Thos. J.**, son of Jno., an excellent dial enameller, died 1893, aged 57.
- Willmot, Stephen**, C.C. 1674.
- **Thomas**, admitted C.C. 1715.
- **John**, 86, St. Margaret's Hill, 1762-75.
- Willoughby, John**, C.C. 1686.
- **Benjamin**, High Cross, 1708.

Willoughby, Benj., Bristol; watch, about 1765.

Willowe, John, Fleet St. One of the first wardens C.C., master 1635. In the B.M. is a watch by him in a fancy case of scalloped shape, 1620-40.

Willshire, James, Glasshouse Yard, Goswell Street, 1769. Mr. J. L. Raymond, New York, has a long-case clock by him.

— **James**, 19, High Holborn, 1781.

Willson, Thomas, admitted C.C. 1659, assistant 1685.

— **George**, admitted C.C. 1692.

— **William**, admitted C.C. 1693.

— **John**, admitted C.C. 1714.

— **Jas.**, London; watch, 1768.

— **G. V.**, 5, St. Alban's Place, St. James's, 1835-40.

Wilmot, George, admitted C.C. 1670.

— **Stephen**, London, maker of 30-hour long-case clock, square dial, about 1730.

— **J.** (See Willmot.)

— **Richard**, 1, Wilmington Sq., 1842.

Wilmshurst, T., Deal; watch, Schloss collection, 1746.

— **and Son**, Brighthelmstone, now Brighton; watch, 1765.

Wilson, Joshua, London, maker of a lantern clock, finely engraved dial, about 1700; also watch, h.m. 1707.

— **Jno.**, Edinburgh, apprenticed to Andrew Brown in 1711.

— **James**, admitted C.C. 1723; Susannah Smith was apprenticed to his wife Hannah Wilson in 1747.

— **George**, admitted C.C. 1730.

— **Alexander**, 132, Drury Lane, hon. freeman C.C. 1781; maker of a verge watch, pair of brass cases, with outside case of tortoiseshell, on which are representations of ferns, 1770-94.

— **Titus**, Lancaster, 1779.

— **Thos.**, London; watch, 1791.

— **James**, 4, King St., Westminster, 1770-94; hon. freeman, 1781.

— **James**, 27, Threadneedle St., 1804; 53, Lombard St., 1810.

— **Jas.**, Askrigg, died 1786.

— **G.**, 17, Craven Buildings, Drury Lane, 1820.

— **W.**, 38, Southampton St., Strand, 1829-42. Afterwards Wilson and Gandar.

— **and Gandar**, 431, Strand, 1855-65.

Wilter, John, maker of a watch in the Guildhall Museum, silver dial, silver *repoussé* case; another example, a silver *repoussé* pair-case watch, Dutch style; another, a calendar watch in the Schloss collection, has

a painting of the Queen of the Poppies on the back of the case; 1760-84.

Wilton, Clay, admitted C.C. 1697; watch by him with embossed case by Cochin, exhibited at the Guelph Exhibition by Mr. Geo. Carr Glyn.

Wiltshire and Sons, 136, Cornhill, 1822-30.

Winch, Amos, admitted C.C. 1677.

Windess, Lancaster; Thos., 1795; Stephen, 1823; Thos., 1825; Wm., 1830.

Windham, Jas., 22, Birchin Lane, 1840.

Windmills, Joseph, St. Martin's-le-Grand, afterwards in Mark Lane; well known as a good maker of clocks and watches; admitted C.C. 1671, master 1702. In the B.M. is a handsome watch by him, silver dial, in which is a semi-circular opening above the centre; through it appears a representation of blue sky, with the sun pointing to the hour by day, and the moon by night; tortoiseshell case. There is a similar watch by Joshua Hutchin; 1658-1703.

— **Thomas**, apprenticed to Joseph Windmills, 1686; admitted C.C. 1695, master 1719; a repeating watch by him in the Guildhall Museum; 1695-1720.

— **J. and T.**, Great Tower St. (Thomas Windmills, master C.C. 1718); many excellent long-case clocks by them are to be met with; 1710-40.

— **and Elkins**, London; bracket clock, about 1725.

Winton, Daniel, C.C. 1718.

Windsor, James, 99, Paul St., Finsbury, 1835-42.

Winerow, William, C.C. 1718.

Wing, Mark, 27, Goswell St., 1816-42.

Wingrove, Sarah, London; watch, about 1745.

Winne, Hy. (See Wynne.)

Winnerl, Joseph T., Paris; born 1799, died 1886.

Winnock, Joshua, C.C. 1672.

— **Daniel**, admitted C.C. 1707.

Winrowe, Wm., London; watch, 1760.

Winsmore, John, admitted C.C. 1712.

Winson, Thos., London; watch, 1782.

Wint, —, Smithfield, 1774.

Winter, Robt., 59, Cannon St., Ratcliffe, 1817.

Winterhalter, —, London; watch, 1810.

Winterhalter, J., 47, St. Andrew St., 1840.

Wintle, David, London; clock, about 1680.

- Wintle, Thos.**, 9, Poultry, 1760-68.
- Wintworth, Thos.**, Sarum; lantern clocks, 1700-40.
- Wirgman, Peter**, 69, St. James's St., 1775-94.
- **G. and G.**, 31, Castle St., Holborn, 1804.
- **Thomas**, 68, St. James's St., 1823.
- **G.**, Hewitt's Court, Strand, 1825.
- **C.**, 5, George St., 1830.
- Wirrall, Copley**, C.C. 1648.
- Wise, Luke**, Reading, 1686.
- (or **Wyse**); several generations among the early makers.
- **John**, admitted C.C. 1669.
- **Richard**, admitted C.C. 1679.
- **John**, admitted C.C. 1683.
- **Thomas**, London, C.C. 1686; maker of a long-case clock in the Vestry of Westminster Abbey, square dial, rings round winding holes.
- **Joseph**, admitted C.C. 1687.
- **Peter**, son of John, admitted C.C. 1693, master 1725; 1693-1726.
- **Luke**, admitted C.C. 1694.
- **Robert**, admitted C.C. 1694.
- **John**, admitted C.C. 1710.
- **Mark**, admitted C.C. 1719.
- **Matthew**, London; watch, 1740.
- Wiseman, John**, admitted C.C. 1647.
- Wiswall, Thos.**, 20, Ely Place, 1800.
- and **Co.**, 52, Red Lion St., 1810.
- With, Thos.**, London; fine bracket clock, day of the month hand, Sheraton case, about 1790.
- Wither, John**, admitted C.C. 1699; maker of long-case clocks.
- Witson, H.**, London; watch, 1825.
- Witte, Samuel**, admitted C.C. 1660.
- Wittingham, Chas.**, London; watch, 1820.
- Wittington, Wm.**, London; watch, about 1700.
- Woerd, Charles Y.**, born 1821, died 1888; a clever mechanic who did much to advance the art of machine watchmaking by designing automatic tools for the Waltham Watch Co., of which he was mechanical superintendent from 1875 to 1882.
- Wogdon, Stephen**, Greenwich; small arch-dial clock, about 1730.
- Wolf, J.**, Wienne; maker of a book-shaped watch shown on p. 101; 1627.
- Wolfe, Joseph**, Mitre Court, near Adgate, 1762-72.
- Wolfgang, Johann**, Pollinger, Fridtberg; repeating watch, S.K.M., about 1730.
- Wolverstone, Thomas**, C.C. 1650.
- **Benjamin**, apprenticed to R. Richards, 1647; admitted C.C. 1657; alarum watch by him in the Guildhall Museum, silver dial, one hand.
- Wolveston, Thomas**, C.C. 1670.
- Wontner, John**, Minorities; a well-known maker, 1770-1812; livery C.C., 1810.
- **John and Son**, 125, Minorities, 1804-12. (See also Rentnow.)
- Wood, Thomas**, admitted C.C. 1691.
- **Robert**, admitted C.C. 1670.
- **John**, admitted C.C. 1701.
- **Henry**, admitted C.C. 1720.
- **Thomas**, admitted C.C. 1727.
- **Dan.**, London; watch, 1745.
- **Jas.**, London; watch, 1760.
- **F.**, Scarboro', 1770-90.
- **Benj.**, London; watch, 1800.
- **Robert**, Horse Shoe Alley, Moorfields, 1785-1810; fine bracket clock, about 1790. (See p. 333.)
- **John**, 32, Minorities, 1775.
- **Thomas Jas.**, 86, Charlotte St., Rathbone Place, 1822-30.
- **Robert**, 4, Hartley Place, Kent Rd., 1820-35.
- Woodall, T. J.**, 3, Birchin Lane, 1804-10.
- **F.**, 1817.
- Woodford, J.**, London; watch, 1736.
- Woodhill, Jabez**, 63, St. Paul's Churchyard, 1830.
- Woodman, Mary**, 29, Paradise Row, Chelsea, 1835.
- Woodruff and Son**, 43, Kirby St., Hatton Garden, 1822-30.
- Woods, Thomas**, admitted C.C. 1713.
- **C. R.**, 21, White Lion St., 1842.
- Woodward, J.**, 8, New Inn Yard, 1835.
- **Thos.**, 24, Curtain Rd., 1835.
- Woolard, John**, 14, Bridge Rd., Lambeth, 1810-18.
- Wooley, Thos.**, 41, Hutton St., 1793.
- Woolverton, Jas.**, C.C. 1677.
- **James**, admitted C.C. 1690.
- Worboys, Arthur**, 4, Wine Office Court, Fleet St., 1769-85.
- **Jno.**, 30, Ludgate Hill, 1780-94.
- Worke, Jno.**, London; many watches, Dutch style, 1760-85.
- Workman, Ben.**, portable sundial, B.M., about 1700.
- Worrall, John**, 71, Goswell Rd., 1840-42.
- Worsley, Thos.**, 22, Cheapside, 1783-1805.
- Worthington, John**, C.C. 1721; watch, 1740.
- Wotton, Thomas**, Fleet St., maker of lantern clocks, 1690-94.
- Wragg, Houlton**, admitted C.C. 1724, known as a maker of long-case clocks, 1724-40.

- Wranch (Wrench?), Jno.**, Chester; lantern clock, about 1750.
- Wray, Hilton**, Birchin Lane, master C.C. 1785; 1770-86.
- Wren, John**, 96, Bishopsgate Without, 1780-85.
- Wrench, John**, Chester, died 1716. Mr. Edward Sudell has a lantern-clock engraved "John Wrench in Chester," dating from about 1680.
- **John**, Chester, died 1751.
- **Jno.**, Chertsey (Chester?); long inland case clock, about 1750.
- **Charles**, "near the Turnpike, Shoreditch," card, Ponsonby collection, about 1780; 57, Bishopsgate St. Within, 1790; 25, Camomile St., 1798; 29, Paternoster Row, 1810-15.
- Wright, John**, maker of an oval watch, B.M., inscribed "Wm. Heade, the owner," representation of the crucifixion engraved inside, about 1620. Part of a circular watch movement, of about the same period, engraved "Johannes Wright in Covent Garden," is in the Guildhall Museum.
- **John**, admitted C.C. 1661.
- **Benjamin**, watchmaker, Bell Alley, Coleman St., C.C. 1685.
- **John**, admitted C.C. 1696.
- **Joseph**, admitted C.C. 1671.
- **John**, admitted C.C. 1700.
- **John**, admitted C.C. 1714.
- **Thomas**, Duke's St., St. Martin's Lane, 1765-75.
- **Thomas**, 6, Poultry, "maker to the King," on a bracket clock; he was a Quaker and a leading watchmaker; in 1783 he patented (No. 1354) a form of detent escapement and compensation balance (see Earnshaw, p. 233); hon. freeman C.C. 1781; 1760-94.
- **Edwd.**, London; watch, 1775.
- **Chas.**, 9, Avemary Lane, 1780; 76, Strand, 1788; 94, Watling St., 1790.
- **T.**, watch-glass maker, Red Lion St., Clerkenwell, 1798; 127, Bunhill Row, 1805-20.
- **S.**, 141, Ratcliff Highway, 1820.
- **Elizabeth**, 141, Ratcliff Highway, 1825.
- **Jas.**, 181, Union St., Borough, 1820-35.
- **Thos.**, 22, Lisle St., Leicester Sq., 1835-42.
- **John**, Pentonville, 1842.
- **William**, 212, Tooley St., 1840-42.
- Wrightman, James**, C.C. 1670.
- **Thomas**, admitted C.C. 1701.
- Wrightmark, Mark**, 49, Percy St., Clerkenwell, 1840-42.
- Wrightson, Thomas**, master C.C. 1737; 1734-38.
- Writs, W.**, Amsterdam; watch, 1767.
- Wyatt, Anthony**, 367, Oxford St., 1800-18.
- **Hy.**, 46, South Audley St., 1840-42.
- Wych, David**, next door to the Cross Keys Tavern, Strand; C.C. 1694.
- Wycherley, John**, born in 1718, at Prescott, Lancashire, where he founded the machine-made watch movement industry; died at Southport, 1891.
- Wyeth, John**, admitted C.C. 1655.
- **Lionel**. (See Wythe.)
- Wyke, R., 2**, Evelyn's Buildings, Oxford St., 1825.
- Wylde, Jno.**, London; watch, 1810.
- Wylder and Hall**, 16, Sun St., Bishopsgate St., 1794.
- Wymark, Mark**, 5, Percival St., 1816-42.
- Wynn, W. M.**, 135, Fleet St., 1804.
- **William**, 19, Dean St., Soho, maker of an exceedingly fine clock for Boston (Lincolnshire) church, no dials, hours and quarters on bells. Is said to have died in Clerkenwell workhouse; 1810-35.
- Wynne, Henry**, admitted C.C. 1662, master in 1690.
- Wythe, Lionel**, admitted C.C. 1646; a good maker. To him was apprenticed Charles Gretton, in 1662; 1646-62.
- Yarde, Thomas**; a watch by him, B.M., about 1580.
- Yardley, James**, Bishop's Stortford; long-case clock, arch dial, date on back of day of month circle, 1763.
- Yate, Wm.**; oval watch, about 1605.
- Yates, Samuel**, admitted C.C. 1648.
- **Samuel**, admitted C.C. 1685.
- **Jno.**, opposite the church, Wandsworth, 1800.
- **Thomas**, Preston; in 1846 he patented (No. 11,443), having fewer teeth in the escape-wheel, so that a watch balance would vibrate only twice a second.
- Yeatman, Andrew**; silver watch, in the Guildhall Museum, about 1700.
- Yelverton, Wm.**, 115, Portland St., 1780-94.
- Yeomans, Ralph**, C.C. 1722.
- Yeriaf**. (See Fairey.)
- Yoakley, Thos.**, London; watch, 1760.
- Yonge, George**, 131, Strand, 1798. Yonge succeeded the celebrated Holmes (the shop was pulled down to make the entrance to Waterloo bridge in 1824); George Yonge and

- Son, 156, Strand, 1823; Geo. and Walter Yonge, same address, 1830-42.
- York, Thomas**, admitted C.C. 1716.
- **John**, 8, Nelson Street, City Rd., 1840.
- Young, William**, Charing Cross, admitted C.C. 1668, assistant 1695; maker of a long oak-case clock, square dial, day of month circle. (See Brown, Andrew.)
- **Henry**, near the Wine House in the Strand; admitted C.C. 1671. "A Gold Watch made by Mr. H. Young, that went with a chain, the Hour of the day and day of the Month. Having a studded Shagrine case, and the square in the inner case where the ring is riveted" (*Lond. Gaz.*, April 26, 29, 1680).
- **Thomas**, admitted C.C. 1699.
- **William**, Charing Cross, admitted C.C. 1682; maker of a small-size walnut and ebony long-case clock, solid hood, spiral pillars, square dial, cherub corners; 1682-1700.
- **Henry**, 89, Fleet St., 1679-1775.
- **Richd.**, London; watch, 1775.
- **James**, 32, Aldersgate St., 1783; livery C.C. 1786.
- **Hy.**, 18, Ludgate Street, 1783-88.
- **Saml.**, Perth; watch, 1781.
- **John**, 44, Great Russell St., Bloomsbury, 1778-1807; livery C.C. 1781.
- **Chas.**, London; centre seconds, duplex watch, free balance spring, stud screwed to plate, about 1805; also a pocket chronometer, about 1817.
- **J.**, 40, Old Gravel Lane, 1820.
- **Wm.**, 15, Butcherhall Lane, 1825.
- **Jas.**, 34, Rosoman St., 1835.
- Zachary, John**, admitted C.C. 1694.
- Zech, Jacob**, Prague; he invented the fusee in 1525; died in 1540 (see p. 68).
- Zollner, Martin**, Augsburg; clock by him, Vienna Treasury, about 1580.

Bilbie; the Hon. H. Hannen has a lantern-clock by Thomas Bilbie, doubtless a member of the Somerset family referred to on page 376; the fret in front shows the royal arms, and the side frets are of the dolphin pattern; this clock dates probably from about 1660.

Bowley; a clock belonging to Mr. G. P. Osbaldeston bears the signature

"Devereux Bowly," in contradistinction to the spelling of Bowley with an *e*, as given on page 380.

Harrison; the long-case clock by John Harrison, with grasshopper escapement, mentioned on page 215 as in the possession of Mr. Thos. Nicholson, Barton-on-Humber, now belongs to his grandson, Mr. W. W. Nicholson.

A FEW EXAMPLES FROM THE SCHLOSS COLLECTION.

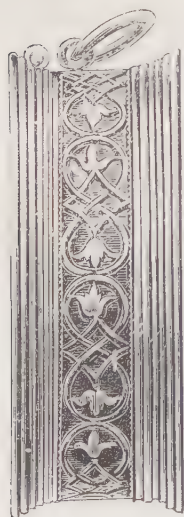
FOUR views of a fine mid-sixteenth century alarum watch in case of gilt metal, front, back and edge perforated. On the front of the cover is a portrait of Mary Tudor, and on the back of the case Philip II. of Spain is represented.



Front, with cover closed.



Front, with cover removed.



Edge.



Back.



Chaunes le jeune,
about 1650.



Watch by
"Flamant à
Paris," in gilt
metal case,
about 1710;
balance
covered by a
gold ena-
melled plaque
with finely
painted re-
presentation
of Cleopatra
as shown.

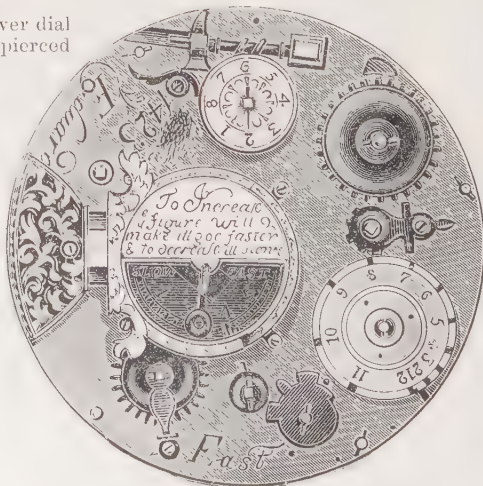


Watch by Henry Harpur; silver dial
with day of the month ring and pierced
centre, inner case of silver
having on the back the arms of
Cromwell, to whose daughter
Bridget the ownership of the
watch is assigned; outer case
of fish skin *piqué* with silver
pins.



Vincent Costontin, Dieppe,
about 1660.

Large striking and alarm
watch by Edward East; inner
case of silver, outer one of fish
skin, *piqué* with silver pins.
Quaintly worded instructions
for regulating.

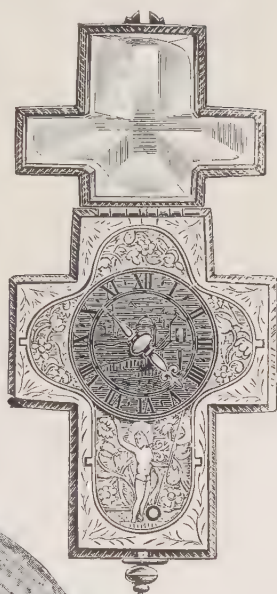




William Yate,
about 1600
(no screws)



Robert Grinkin,
about 1610.



Unnamed,
late XVI. cen-
tury.



Fine specimen of pierced
chasing;
French, about 1560.



Gudin à Paris, about 1765. Chased
decoration with gold of green, yellow,
copper and silvery tints.



French, early XVII. century. Covers
of crystal, side panels of brown topaz.
(Formerly in the Spitzer collection.)



Edward East,
about 1610.



Jacob Wibrandt, Leu-
warden, about 1630.



Large travelling clock-watch by Anthony Bradl, Augsburg, about 1680. Inner case of silver splendidly pierced and chased, with representations of hunting scenes, flowers and birds as shown; outer case of fish skin. The number of blows last struck may be repeated at pleasure by pulling a string depending from the case.

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NOTE.—If particulars of a maker are required, refer first to the Alphabetical List, which begins on page 366.

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